



U.S. Department of the Interior
Bureau of Land Management
Colorado State Office

Colorado River Valley Field Office

October 2011



**Gibson Gulch II Master Development Plan for
Natural Gas Exploration and Development
DOI-BLM-CO-N040-2011-0030-EA
Bill Barrett Corporation**



Prepared by
Bureau of Land Management
Colorado River Valley Field Office
2300 River Frontage Road
Silt, Colorado 81652

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DOI-BLM-CO-040-2011-0030-EA

The Environmental Assessment (EA) analyzing the environmental effects of the Proposed Action has been reviewed. Project design and approved mitigation measures result in a Finding of No Significant Impact on the human environment. Therefore, an Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (NEPA) is not necessary to further analyze the environmental effects of the Proposed Action.

DECISION RECORD

DECISION: It is my decision to approve the Proposed Action for the Gibson Gulch II Master Development Plan (GGIIMDP) as described in the attached EA. This decision will provide for the orderly, economical, and environmentally sound exploration and development of oil and gas resources on valid Federal leases. The Proposed Action includes some components associated with Applications for Permits to Drill (APDs) previously submitted by BBC as well as future components for which specific surface locations, associated facilities, access roads, and pipelines are disclosed and analyzed in the EA.

RATIONALE: The bases for this decision are as follows:

1. Approval of the Proposed Action validates the rights granted with the Federal oil and gas leases to develop the leasehold to provide commercial commodities of oil and gas.
2. Environmental impacts would be avoided, minimized, or mitigated by the best management practices and mitigation measures included in the Proposed Action or otherwise applied and enforced by the BLM as Conditions of Approval (COAs).
3. This decision does not authorize the initiation of surface-disturbing activities on BLM lands or the development of new Federal oil and gas wells on new or existing well pads. Surface-disturbing activities on BLM lands and development of Federal wells will not commence until approval by BLM of APDs or granting by BLM of rights-of- in conjunction with the GGIIMDP.

MITIGATION MEASURES: The EA describes stipulations for the protection of surface resources on lands overlying the affected Federal leases through no surface occupancy (NSO), controlled surface use (CSU), and timing limitation (TL) restrictions. In addition, the EA analyzes the effectiveness of mitigation measures to be applied by the BLM as general and site-specific surface-use COAs or right-of-way stipulations (Appendix A) or committed to by BBC (Appendix B).

NAME OF PREPARER: Vanessa Bull, Natural Resource Specialist, Project Lead

SIGNATURE OF AUTHORIZED OFFICIAL:



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DATE: Oct 24, 2011

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1. INTRODUCTION

1.1 Background

Bill Barrett Corporation (BBC) is proposing a 5-year development program for oil and gas exploration and development on 2,360 acres of Federal lands located in the southern Piceance Basin, Township 6 South, Range 91 West, Sections 19, 20, 29, and 32-34, approximately 3.5 miles southeast of the town of Silt, Garfield County, Colorado. The majority of the area (2,080 acres) in the proposed project was previously analyzed in 2008 under the Gibson Gulch Master Development Plan (MDP). This current proposal, referred to as the Gibson Gulch II Master Development Plan (GGIIMDP), arises from the implementation of drilling that successfully demonstrated the potential of the area for economically viable reserves of natural gas.

The total project area is underlain by Federal mineral estate. If approved as proposed, implementation of the GGIIMDP would result in drilling up to 88 new wells in Federal leases COC46972, COC50126, COC51440, and COC66718. The wells would be drilled from a total of six new locations on Federal surface. One new private or “Fee” well would also be directionally drilled from the MDP 22 location.

Permanent surface facilities needed at each pad to support oil and gas development would include the wellheads, separation/dehydration units, gas metering units, combustors, radio antennas, solar panels, and above-ground tanks for storage of condensate and produced water. Each pad would also have a “cuttings pit” for the disposal of drill cuttings. Produced water from the wells would be transported by buried pipeline, or by truck when necessary, to BBC’s water collection facilities. Small natural gas compressor units may be necessary to power gas lifts at the wells. Following completion activities at a pad, areas not needed during production would be revegetated using reclamation methods, standards, and plant species specified by the Bureau of Land Management (BLM). When all of the wells at a pad are no longer producing economic quantities of gas, the wells would be plugged and abandoned, and the pad would undergo final reclamation.

Surface disturbance associated with the proposed GGIIMDP would include the development of new well pads and associated roads and pipeline right-of-way (ROW) corridors, along with the expansion and upgrade of existing infrastructure. In total, six new well pads and approximately 3.8 miles of new roads would be constructed if approved as proposed. Upon approval of the GGIIMDP, the BLM anticipates issuing ROW grants to BBC for use of an existing road to access the Section 19 pads in the northern part of the GGIIMDP area and for construction and use of a new road and pipelines—portions of which would be collocated—to access the Section 33 pads in the southern part of the GGIIMDP area.

1.2 Purpose and Need

The purpose of this proposal is to develop natural gas resources on Federal leases COC46972, COC50126, COC51440, and COC66718 consistent with existing lease rights. The action is needed to increase the development of natural gas resources for commercial marketing to the public.

Instead of structuring the development of these leases as a series of individual actions, the Colorado River Valley Field Office land use plan (BLM 1984, revised 1988), amendments to the plan for oil and gas exploration and development (BLM 1991, 1999), and BLM regulations specify the use of multi-well development plans to more effectively manage the development of Federal fluid mineral resources.

Specifically, the purpose is to drill wells to explore for, test, and develop natural gas resources in a variety of geologic settings, differing stratigraphic targets, and various structural settings assuming it is commercially viable in this area.

The need for the proposed project is for BBC to fulfill its obligations and responsibilities under its Federal oil and gas lease requirements to explore, develop, and test hydrocarbon reserves by drilling for commercial quantities of natural gas or oil resources. In addition, if the proposed wells are productive, the proposed project would:

- generate Federal, State, and County royalty revenues and/or taxes
- support local economies by providing and maintaining employment opportunities and expanding the local tax base
- contribute to available natural gas or oil supply for the national market
- reduce dependence on potentially unstable foreign sources of energy
- contribute to the supply of natural gas as a transition fuel to reduce use of electrical generation and, in the form of compressed natural gas (CNG), diesel and gasoline for fleet vehicles

The BLM's approval of exploration and production from Federal oil and gas leases is an integral part of BLM's oil and gas program under authority of the Mineral Leasing Act of 1920 (MLA) (30 United States Code [U.S.C.] § 181 et seq.), as amended by the Federal Land Policy and Management Act of 1976 (FLPMA) and the Federal Onshore Oil and Gas Leasing Reform Act of 1987. The intent of the MLA and its regulations is to allow and encourage lessees to explore for oil and gas underlying public lands. FLPMA mandates that BLM manage public lands on the basis of multiple use (43 U.S.C. 1701(a)(7)). Minerals are identified as one of the principal uses of public lands under Section 103 of FLPMA (43 U.S.C. 1702(c)).

The BLM oil and gas-leasing program encourages development of domestic oil and gas reserves and the reduction of U.S. dependence on foreign energy sources. The BLM would consider approval of the Proposed Action in a manner that avoids undue or unnecessary degradation of public lands, as required under FLPMA, and that is consistent with the Comprehensive National Energy Strategy announced by the U.S. Department of Energy (DOE) in April 1998 (DOE 1998), the Energy Policy and Conservation Act (42 U.S.C. 6201), and the Energy Policy Act of 2005 (Public Law 109-58).

2. PROPOSED ACTION AND NO ACTION ALTERNATIVE

The total number of wells drilled, and wells drilled per year, would depend largely on factors out of BBC's control, such as availability of drill rigs, geologic success, engineering technology, economic factors (e.g., the price of natural gas and the cost of services), availability of commodity markets, and lease stipulations and notices.

The proposed development would consist of six well pads encompassing approximately 32 acres of short-term disturbance, including Federal surface and mineral ownership, and one well that would be drilled from Federal surface into Fee minerals (Figure 1). Associated with these developments would be the construction of up to approximately 3.2 miles of new access roads and pipelines (Table 1).

2.1 Proposed Action

2.1.1 Well Pads

The locations of proposed well pads reflect the results of onsite inspections by representatives of the BLM, BBC and its contractors, and private landowners, as applicable. The primary purpose of the onsite inspections was to assess potential resource impacts associated with various construction, drilling, and production activities.

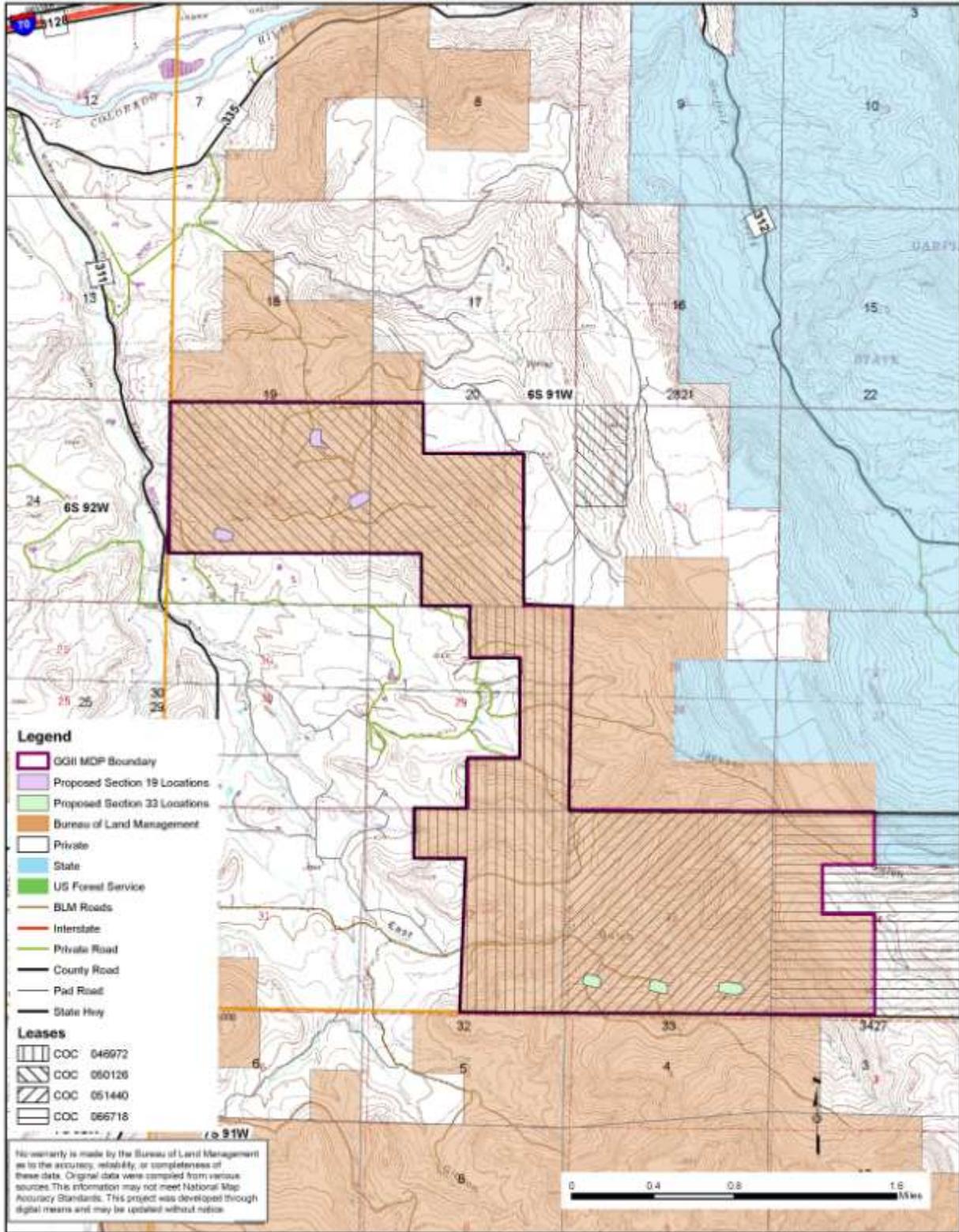


Figure 1. Gibson Gulch II MDP Project Area

GIBSON GULCH II MASTER DEVELOPMENT PLAN

Table 1. Location and Disturbance Acres of Proposed Project Components							
Proposed New Well Pads							
<i>Pads</i>	<i>Lease</i>	<i>Surface Location T6S, R 91W</i>	<i>Surface Owner</i>	<i>Disturbance (acres)</i>		<i>Interim Reclamation (acres)</i>	
				<i>Initial</i>	<i>Long-term</i>		
MDP 21	COC50126	NWSW, NESW Sec. 19	Federal	4.37	0.96	3.41	
MDP 22	COC50126, Fee	SENE, NESE Sec. 19, SWNW Sec. 20	Federal	5.01	1.96	3.05	
MDP 23	COC50126	NWNE, NENE Sec. 19	Federal	4.14	1.45	2.96	
MDP 24	COC46972, COC51440	SWSW Sec. 33	Federal	5.03	1.28	3.75	
MDP 25	COC51440	SESW Sec. 33	Federal	5.22	1.23	3.99	
MDP 26	COC51440 COC66718	SWSE, SESE Sec. 33	Federal	8.23	1.69	6.54	
TOTAL				32.00	8.57	23.70	
Proposed New Roads and Two-Track Upgrades							
<i>Well Pad Accessed</i>	<i>Length</i>		<i>Surface Location T6S, R 91W</i>	<i>Surface Owner</i>	<i>Disturbance (acres)</i>		<i>Interim Reclamation (acres)</i>
	<i>miles</i>	<i>feet</i>			<i>Initial</i>	<i>Long-term</i>	
MDP 21	0.11	565	Section 19	Federal	0.65	0.39	0.26
MDP 22	0.21	1,114	Section 19	Federal	1.28	0.77	0.51
MDP 23	1.01	5,357	Section 19	Federal	6.15	3.69	2.46
MDP 24	1.34	7,056	Section 33	Federal	8.10	4.86	3.24
MDP 25	0.21	1,109	Section 33	Federal	1.27	0.76	0.51
MDP 26	0.29	1,531	Section 33	Federal	1.76	1.05	0.70
TOTAL	3.17	16,732			19.21	11.52	7.68
Proposed New Pipelines							
<i>Well Pad Served</i>	<i>Length</i>		<i>Surface Owner</i>	<i>Disturbance (acres)</i>		<i>Interim Reclamation (acres)</i>	
	<i>miles</i>	<i>feet</i>		<i>Initial</i>	<i>Long-term</i>		
MDP 21	0.12	611	Federal	0.70	0	0.70	
MDP 21	0.19	1,020	Fee	1.17	0	1.17	
MDP 22	0.64	3,353	Federal	3.85	0	3.85	
MDP 23	0.41	2,146	Federal	2.46	0	2.46	
MDP 24	0.12	645	Federal	0.74	0	0.74	
MDP 25	1.05	5,518	Federal	6.33	0	6.33	
MDP 25 to MDP 6	0.05	254	Fee	0.29	0	0.29	
MDP 26	0.30	1,579	Federal	1.81	0		
Subtotal BLM	2.62	13,852		15.90	0	15.90	
Subtotal Private	0.24	1,274		1.46	0	1.46	
TOTAL	2.86	15,126		17.36	0	17.36	
GRAND TOTAL	6.03	31,858		68.57	20.09	48.74	

Each onsite field visit included assessment of proposed pad and pit layout, cuts and fills, topsoil stockpiling, erosion control, access, pipeline routes, and reclamation potential of each activity. In some cases, multiple revisions to individual proposed well locations, pipelines, and access routes were made to minimize potential impacts identified by BLM or to accommodate a landowner's requests. Surface use

agreements (SUAs) currently exist between BBC and private landowners for road and pipeline construction.

The proposed well pads would be constructed from native soil and rock materials using appropriate heavy equipment. The pads would be constructed by clearing all vegetation, stripping and stockpiling topsoil along the edge of the well pad for use during reclamation, and leveling the pad area using cut-and-fill techniques. Topsoil would be bermed around the pad perimeter and temporarily reseeded with an approved seed mix. Juniper trees removed during construction would be placed at the toe of the fill slopes to help contain the fill, as well as act as a sediment control and filtration system for stormwater management. Pinyon trees would be chipped, or logged and removed from the site. Any other woody vegetation would be mulched or used in reclamation, and/or placed at the toe of the fill slopes. Cut slopes associated with pad construction would be left rough to provide a seed catchment surface, and may require "step cutting" when heights exceed 15 feet. Cut slopes for pad construction would not be steeper than 1.5 to 1 (horizontal to vertical), except when approved by the BLM. The tops of cut banks and pad corners may be rounded to improve their appearance and reduce the volume of cut and fill material.

A cuttings trench would be constructed during the course of pad construction to store cuttings generated from drilling. Depending upon space requirements, cuttings may also be stacked on location prior to site reclamation. The cuttings trench or reserve pit would be fenced as appropriate and in accordance with BLM and Colorado Oil and Gas Conservation Commission (COGCC) guidelines. The well pad itself would not be fenced.

Initially, the size of the newly constructed pads would range from about 4.1 to 8.2 acres (Table 1). Interim reclamation activities would begin after all wells are drilled, completed, and production facilities installed. Cuts and fills would be recontoured and revegetated to blend in with adjacent natural slopes as much as possible, and seeded to reestablish vegetation cover. These interim reclamation techniques would result in a significant reduction of remaining surface disturbance that would remain over the long-term life of the project (i.e., 20 to 30 years). Table 1 presents the size of the pads during drilling and completion activities (initial disturbance) and after interim reclamation (long-term disturbance).

The sides of the well pads would be bermed, if appropriate, to prevent stormwater from flowing off the pad and into nearby drainages. Stormwater may be directed to an opening in the berm that leads off the pad to a sediment trap or other control as appropriate. BBC's stormwater management efforts may include additional engineering measures, such as the installation of culverts to divert water flow away from surface locations as needed, and other runoff controls and barriers.

On average, five personnel, mostly equipment operators, would work on the construction of an individual well pad. Construction of an individual well pad could take from 1 to 3 weeks depending on the features of each particular site.

Prior to individual well pad construction, BBC would obtain approval of an Application for Permit to Drill (APD) by the BLM and the COGCC. Each APD would contain site-specific Conditions of Approval (COAs) that apply to construction and well operations.

2.1.2 Access Roads

Implementation of the Proposed Action would require construction and improvements of access roads on BLM and Fee surface. Portions on BLM land outside the leases included within the GGIIMDP area would require issuance of ROW grants by the BLM. The majority of proposed and existing two-track access roads requiring upgrades would be paralleled by pipelines (i.e., collocated roads and pipelines). Where new pipelines are proposed adjacent to access roads, a 100-foot-wide ROW would initially be needed (50

feet for the road plus 50 feet for the pipelines). To the extent possible, BBC would attempt to limit the overall disturbance from road and pipeline construction. Various segments of these access roads are outside of the Gibson Gulch Unit boundary. To gain access for the use of existing roads and the construction and use of proposed roads, BBC has applied to the BLM for ROW grants authorizing access across BLM-administered lands outside of the unit boundary.

Roads would be designed and maintained to an appropriate standard no higher than necessary to accommodate their intended functions, as described in the *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, Fourth Edition* (USDI and USDA 2007)(the “Gold Book”) and BLM Handbook 9113 (*Roads Manual*).

Aggregate for road surfacing would be obtained from private or Federal lands in conformance with applicable regulations. Aggregate would be of sufficient size, type, and amount to allow all weather access and alleviate dust. Following interim reclamation, the running surface width could vary from 22 to 24 feet but would typically be 22 feet wide throughout the project area with safety, site distance, grade, topography, anticipated traffic flow, and visual resource management concerns being factors in actual width determination.

Road construction would include clearing and grubbing of brush and trees, windrowing of topsoil, construction of reinforced rolling dips and grade dips where feasible, installation of culverts in ditched sections and side drainages to provide ditch relief and sediment control, construction of retaining structures on steep slopes (as approved by the BLM), placement of slash and topsoil on cut and fill slopes, placement of erosion controls on cut and fill slopes as approved by the BLM, seeding of all disturbed areas outside of the running surface, and installation of cattle guards and road closure gates as necessary.

Revegetation of road ditches and cut and fill slopes would help stabilize exposed soil and reduce sediment loss, reduce the growth of noxious weeds, reduce maintenance costs, maintain scenic quality and forage, and protect habitat. To ensure successful growth of vegetation, topsoil would be stripped and stockpiled during road construction and re-spread to the greatest degree practical on cut slopes, fill slopes, and borrow ditches prior to seeding.

The average grade would be 10 percent or less, wherever possible. The 10-percent grade would be exceeded only where the terrain or unusual circumstances require it. Minimum horizontal curve radii would be 100 feet. Where terrain would not allow a 100-foot curve radius, the curve would be widened. Road construction would result in approximately 19 acres of short-term ground disturbance. Following interim reclamation, the long-term disturbance would be approximately 11 acres. Road maintenance would be performed as needed to ensure safe travel and control dust.

Workforce would include an average of five personnel per day to operate the equipment.

2.1.3 Gas Gathering and Water Pipelines

A network of gas gathering and water pipelines is necessary to both gather and deliver natural gas offsite to existing main gathering lines and to transport water to facilities within and outside the project area. Figure 2 shows the proposed pipelines associated with the MDP 21-23 pads. Figure 3 shows the proposed routes for the pipelines associated with the MDP 24-26 pads as described below. Various segments of the proposed pipelines are outside of the Gibson Gulch Unit boundary. BBC has applied to the BLM for ROW grants to authorize construction and use of natural gas, produced water, and fresh water pipelines across BLM lands outside the unit boundary. The ROWs applied for would be 50 feet wide (short-term disturbance) and reclaimed to a 30-foot wide permanent ROW.

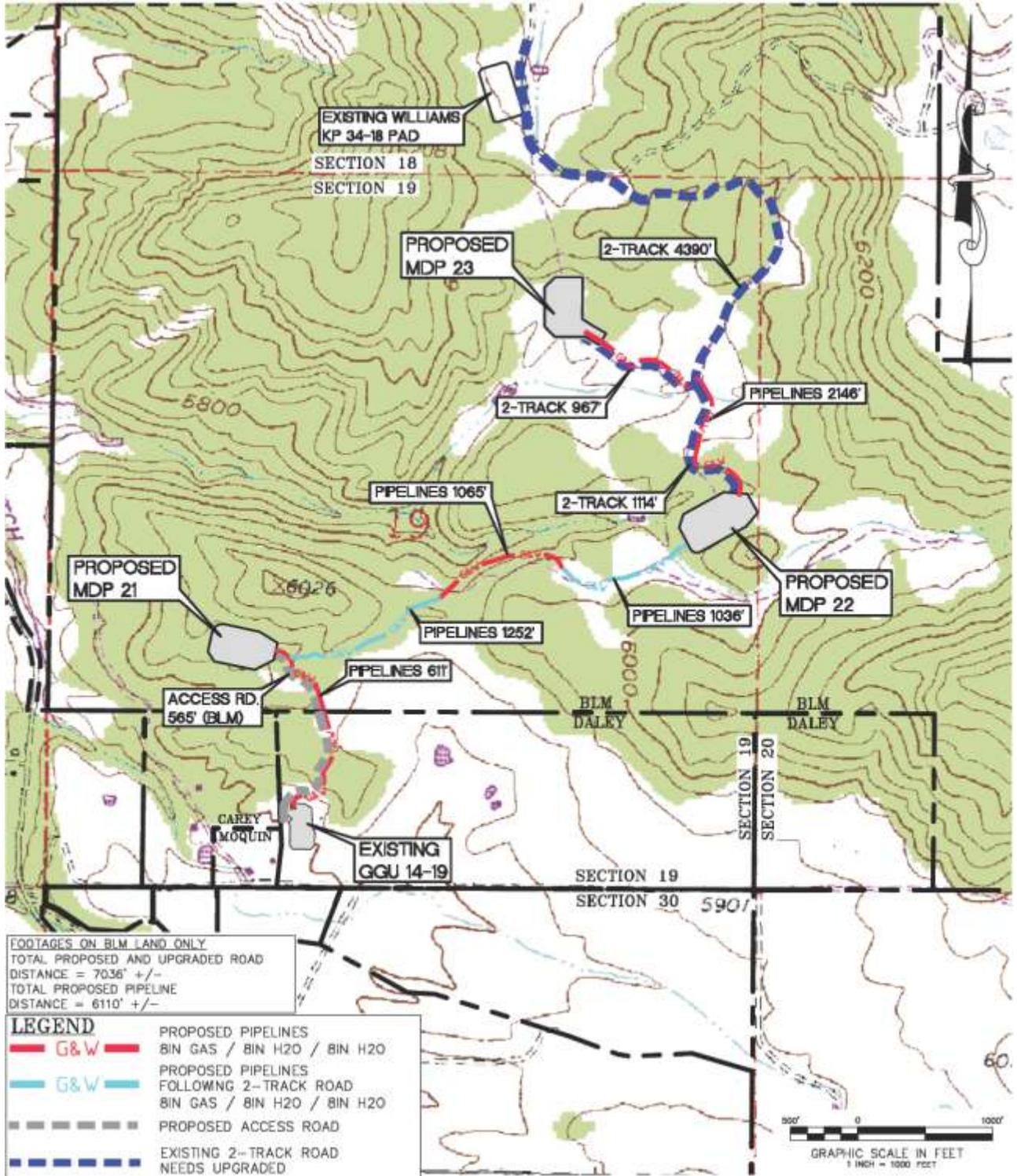


Figure 2. Proposed Road and Pipeline Alignments for MDP 21-23 Pads
 Northern Portion of GGIIMDP Area

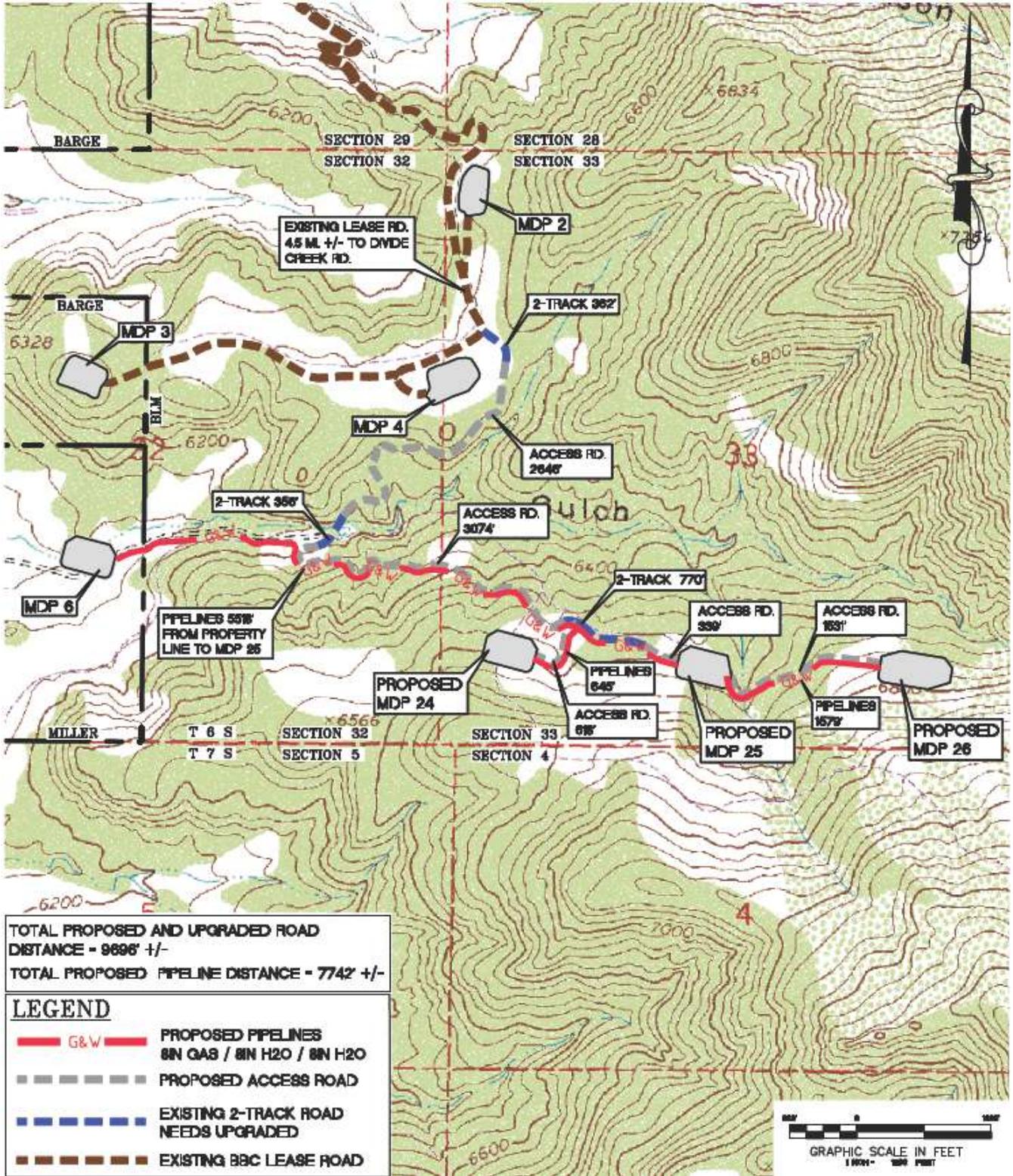


Figure 3. Proposed Road and Pipeline Alignments for MDP 24-26 Pads
 Southern Portion of GGIIMDP Area

Gas gathering pipelines would be constructed of steel with a maximum allowable working pressure of 740 pounds per square inch and a diameter up to 12 inches. Gathering lines that parallel new road construction would be installed in the uphill or cut side of the road, in the shoulder where possible, prior to final grading and aggregate application. Water lines would be constructed of steel or poly pipe 6 to 8 inches in diameter and installed in a common trench with the gas gathering lines to minimize surface disturbance. These pipelines would be operated and maintained by BBC through the life of the project.

Use of the proposed well pads and access roads would facilitate the staging for the pipeline construction. The pipeline trench would be excavated mechanically primarily in the uphill, or cut side of the road corridor, with an excavator (trackhoe) and would be approximately 3 to 7 feet wide and at least 4 feet deep. Gas pipeline segments would be welded together and lowered in the trench. The water line would then be placed into the ditch and separated from the gas line by sandbags. Both lines would be covered with excavated material, and then each pipeline would be tested with fresh water, nitrogen gas, or compressed air to locate any leaks. Fresh water and nitrogen used for testing would be obtained offsite and transported to the testing location by truck. After testing, the water would be disposed of at an existing offsite facility. Nitrogen or air would be vented to the atmosphere.

2.1.4 Mitigation Common to All Construction Operations

Trees removed from the pad locations and access roads would be placed at the toe of the fill slopes to act as a sediment control and filtration system for stormwater management, and /or placed back on the reclaimed surfaces. Cut pinyon pine trees would be chipped, buried, or logged and removed from the site to prevent the spread of the *Ips* beetle. If trees cannot be placed at the toe of fill slopes, the trees would be cut to a maximum stump height of 6 inches and placed back onto the cut and/or fill slopes with the slash height not to exceed 24 inches. Root balls would be buried or placed at the toe of the fill slopes. Trees and other vegetation may be dozed on pipeline routes and then pulled back onto the ROW as part of final reclamation. Other vegetation, such as sagebrush and other shrubs, may be scattered offsite or placed on well pads and road fills to help visually screen the slopes. On pads where boulder fields exist, reclamation would include the replacement of boulders in order to reconstruct a more natural appearance.

2.1.5 Drilling Operations

Up to 88 wells would be drilled as part of the Proposed Action. Table 2 lists the surface location of the wells, as well as the footages from section lines for the bottom-hole locations.

Table 2. List of Wells and Bottomhole Locations					
MDP 21	Sec.	T	R	FOOTAGES	MINERALS
GGU Federal 13A-19-691	19	6S	91W	1495 feet FSL; 660 feet FWL	Federal
GGU Federal 13B-19-691	19	6S	91W	1818 feet FSL; 660 feet FWL	Federal
GGU Federal 13C-19-691	19	6S	91W	2141 feet FSL; 660 feet FWL	Federal
GGU Federal 13D-19-691	19	6S	91W	2464 feet FSL; 660 feet FWL	Federal
GGU Federal 23A-19-691	19	6S	91W	1495 feet FSL; 1980 feet FWL	Federal
GGU Federal 23B-19-691	19	6S	91W	1818 feet FSL; 1980 feet FWL	Federal
GGU Federal 23C-19-691	19	6S	91W	2141 feet FSL; 1980 feet FWL	Federal
GGU Federal 23D-19-691	19	6S	91W	2464 feet FSL; 1980 feet FWL	Federal
GGU Federal 22A-19-691	19	6S	91W	2485 feet FNL; 1980 feet FWL	Federal
GGU Federal 22B-19-691	19	6S	91W	2145 feet FNL; 1980 feet FWL	Federal
GGU Federal 22C-19-691	19	6S	91W	1805 feet FNL; 1980 FWL	Federal

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GGU Federal 22D-19-691	19	6S	91W	1465 feet FNL; 1980 feet FWL	Federal
GGU Federal 33A-19-691	19	6S	91W	1495 feet FSL; 1980 feet FEL	Federal
GGU Federal 33B-19-691	19	6S	91W	1818 feet FSL; 1980 feet FEL	Federal
GGU Federal 33C-19-691	19	6S	91W	2141 feet FSL; 1980 feet FEL	Federal
MDP 22	Sec.	T	R	FOOTAGES	MINERALS
GGU Federal 33D-19-691	19	6S	91W	2464 feet FSL; 1980 feet FEL	Federal
GGU Federal 32A-19-691	19	6S	91W	2485 feet FNL; 1980 feet FEL	Federal
GGU Federal 32B-19-691	19	6S	91W	2145 feet FNL; 1980 feet FEL	Federal
GGU Federal 32C-19-691	19	6S	91W	1805 feet FNL; 1980 feet FEL	Federal
GGU Federal 32D-19-691	19	6S	91W	1465 feet FNL; 1980 feet FEL	Federal
GGU Federal 43A-19-691	19	6S	91W	1495 feet FSL; 660 feet FEL	Federal
GGU Federal 43B-19-691	19	6S	91W	1818 feet FSL; 660 feet FEL	Federal
GGU Federal 43C-19-691	19	6S	91W	2141 feet FSL; 660 feet FEL	Federal
GGU Federal 43D-19-691	19	6S	91W	2464 feet FSL; 660 feet FEL	Federal
GGU 44D-19-691	19	6S	91W	1135 feet FSL; 660 FEL	Private
GGU Federal 13A-20-691	20	6S	91W	1500 feet FSL; 660 feet FWL	Federal
GGU Federal 13C-20-691	20	6S	91W	2141 feet FSL; 660 feet FWL	Federal
GGU Federal 13D-20-691	20	6S	91W	2464 feet FSL; 660 feet FWL	Federal
MDP 23	Sec.	T	R	FOOTAGES	MINERALS
Federal 21A-19-691	19	6S	91W	1125 feet FNL; 1980 feet FWL	Federal
Federal 21B-19-691	19	6S	91W	785 feet FNL; 1980 feet FWL	Federal
Federal 21C-19-691	19	6S	91W	445 feet FNL; 1980 feet FWL	Federal
Federal 21D-19-691	19	6S	91W	105 feet FNL; 1980 feet FWL	Federal
Federal 31A-19-691	19	6S	91W	1125 feet FNL; 1980 feet FEL	Federal
Federal 31B-19-691	19	6S	91W	785 feet FNL; 1980 feet FEL	Federal
Federal 31C-19-691	19	6S	91W	445 feet FNL; 1980 feet FEL	Federal
Federal 31D-19-691	19	6S	91W	105 feet FNL; 1980 feet FEL	Federal
Federal 41A-19-691	19	6S	91W	1125 feet FNL; 660 feet FEL	Federal
Federal 41B-19-691	19	6S	91W	785 feet FNL; 660 feet FEL	Federal
Federal 41C-19-691	19	6S	91W	445 feet FNL; 660 feet FEL	Federal
Federal 41D-19-691	19	6S	91W	105 feet FNL; 660 feet FEL	Federal
Federal 42A-19-691	19	6S	91W	2485 feet FNL; 660 feet FEL	Federal
Federal 42B-19-691	19	6S	91W	2145 feet FNL; 660 feet FEL	Federal
Federal 42C-19-691	19	6S	91W	1805 feet FNL; 660 feet FEL	Federal
Federal 42D-19-691	19	6S	91W	1465 feet FNL; 660 feet FEL	Federal
MDP 24	Sec.	T	R	FOOTAGES	MINERALS
Federal 44A-32-691	32	6S	91W	165 feet FSL; 665 feet FEL	Federal
Federal 44B-32-691	32	6S	91W	476 feet FSL; 665 feet FEL	Federal
Federal 44C-32-691	32	6S	91W	788 feet FSL; 665 feet FEL	Federal
Federal 44D-32-691	32	6S	91W	1100 feet FSL; 665 feet FEL	Federal
Federal 14A-33-691	33	6S	91W	165 feet FSL; 665 feet FWL	Federal
Federal 14B-33-691	33	6S	91W	489 feet FSL; 665 feet FWL	Federal

GIBSON GULCH II MASTER DEVELOPMENT PLAN

Federal 14C-33-691	33	6S	91W	813 feet FSL; 665 feet FWL	Federal
Federal 14D-33-691	33	6S	91W	1137 feet FSL; 665 feet FWL	Federal
Federal 13A-33-691	33	6S	91W	1461 feet FSL; 665 feet FWL	Federal
Federal 13B-33-691	33	6S	91W	1786 feet FSL; 665 feet FWL	Federal
Federal 13C-33-691	33	6S	91W	2110 feet FSL; 665 feet FWL	Federal
Federal 13D-33-691	33	6S	91W	2434 feet FSL; 665 feet FWL	Federal
MDP 25	Sec.	T	R	FOOTAGES	MINERALS
Federal 34A-33-691	33	6S	91w	165 feet FSL; 2023 feet FEL	Federal
Federal 34B-33-691	33	6S	91w	498 feet FSL; 2023 feet FEL	Federal
Federal 34C-33-691	33	6S	91w	831 feet FSL; 2023 feet FEL	Federal
Federal 34D-33-691	33	6S	91w	1163 feet FSL; 2023 feet FEL	Federal
Federal 33A-33-691	33	6S	91w	1496 feet FSL; 2023 feet FEL	Federal
Federal 33B-33-691	33	6S	91w	1829 feet FSL; 2023 feet FEL	Federal
Federal 33C-33-691	33	6S	91w	2162 feet FSL; 2023 feet FEL	Federal
Federal 33D-33-691	33	6S	91w	2495 feet FSL; 2023 feet FEL	Federal
Federal 24A-33-691	33	6S	91w	165 feet FSL; 2023 feet FWL	Federal
Federal 24B-33-691	33	6S	91w	498 feet FSL; 2023 feet FWL	Federal
Federal 24C-33-691	33	6S	91w	831 feet FSL; 2023 feet FWL	Federal
Federal 24D-33-691	33	6S	91w	1163 feet FSL; 2023 feet FWL	Federal
Federal 23A-33-691	33	6S	91w	1496 feet FSL; 2023 feet FWL	Federal
Federal 23B-33-691	33	6S	91w	1829 feet FSL; 2023 feet FWL	Federal
Federal 23C-33-691	33	6S	91w	2162 feet FSL; 2023 feet FWL	Federal
Federal 23D-33-691	33	6S	91w	2495 feet FSL; 2023 feet FWL	Federal
MDP 26	Sec.	T	R	FOOTAGES	MINERALS
Federal 14A-34-691	34	6S	91W	165 feet FSL; 665 feet FWL	Federal
Federal 14B-34-691	34	6S	91W	502 feet FSL; 665 feet FWL	Federal
Federal 14C-34-691	34	6S	91W	839 feet FSL; 665 feet FWL	Federal
Federal 14D-34-691	34	6S	91W	1176 feet FSL; 665 feet FWL	Federal
Federal 13A-34-691	34	6S	91W	1513 feet FSL; 665 feet FWL	Federal
Federal 13B-34-691	34	6S	91W	1850 feet FSL; 665 feet FWL	Federal
Federal 13C-34-691	34	6S	91W	2187 feet FSL; 665 feet FWL	Federal
Federal 13D-34-691	34	6S	91W	2524 feet FSL; 665 feet FWL	Federal
Federal 44A-33-691	33	6S	91W	165 feet FSL; 665 feet FEL	Federal
Federal 44B-33-691	33	6S	91W	502 feet FSL; 665 feet FEL	Federal
Federal 44C-33-691	33	6S	91W	839 feet FSL; 665 feet FEL	Federal
Federal 44D-33-691	33	6S	91W	1176 feet FSL; 665 feet FEL	Federal
Federal 43A-33-691	33	6S	91W	1513 feet FSL; 665 feet FEL	Federal
Federal 43B-33-691	33	6S	91W	1850 feet FSL; 665 feet FEL	Federal
Federal 43C-33-691	33	6S	91W	2187 feet FSL; 665 feet FEL	Federal
Federal 43D-33-691	33	6S	91W	2524 feet FSL; 665 feet FEL	Federal

BBC's drilling operations would be conducted in compliance with all Federal Onshore Oil and Gas Orders, all applicable rules and regulations, and Notices to Lessees. Drilling rigs in the project area would be targeting natural gas-producing horizons in the Mesaverde and Iles formations at depths of 4,500 to 8,500 feet.

Drilling activities would typically occur 24 hours per day with approximately 12 workers for a period of 5 to 7 days per well. Completion activities would also typically occur 24 hours per day with approximately 15 workers for a period of 2 to 3 days per well. Pads with multiple wells would be occupied for an extended period of time, depending on the number of wells drilled. Completion of wells is generally done on a zone basis with the same zone for all wells on a pad being stimulated at the same time and then progressing upward through each zone in each group of wells, so the total completion time for any given well may extend beyond the 2 to 3 days that would be required for completing a single well. Production results for wells drilled during the first year would be used to plan and design the drilling program for subsequent years.

BBC intends initially to drill and complete 8 to 16 wells on a pad, possibly causing drilling operations to be conducted in more than one phase. For example, BBC currently plans to drill eight wells on the MDP 26 pad and evaluate the gas production from those wells prior to drilling the remaining wells from that pad. Development would be highly sensitive to the price of gas and cost of services. The BLM would be notified in a timely manner of any scheduling changes. If all wells on the pad are not drilled in a continuous operation, BBC may request approval for the pad to remain unreclaimed until the following drilling season. Temporary (pre-interim) reclamation would be conducted in accordance with BLM and COGCC requirements as described in a subsequent section of this Proposed Action. Because of geologic and market uncertainties, BBC may drill fewer wells than those described in this Proposed Action.

Current plans call for use of mud rotary platform rigs with capability matched to the depth requirements of the proposed well. Drilling would be accomplished with a closed-loop system. Descriptions of the drilling procedure for each proposed well would be included in the well-specific APDs to be submitted to BLM by BBC. Drill cuttings would be contained in a cuttings trench and ultimately stacked, spread, or buried onsite as part of approved pit closure or cuttings disposal procedures. Some drill cuttings may also be incorporated as part of the reclamation of well pads, in accordance with BLM and COGCC rules.

A small truck-mounted drilling rig would be used to drill the conductor pipe and rat holes. Once the conductor pipe is set and cemented in place, another drilling rig would move on location to preset surface casing. Lastly, the conventional drilling rig would be moved in and rigged up to spud (begin drilling) the production holes to total depth. Prior to drilling below the surface casing, well control equipment (Blowout Preventer and Choke Manifold) would be installed on the surface casing and both the well control equipment and surface casing would be tested to ensure adequate well control. The well control equipment would meet the minimum standards of Onshore Oil and Gas Order No. 2 (Drilling Operations), and the BLM would be notified in advance of all pressure tests in order to be present and witness the tests. Charts of the tests are kept on location and are available to the BLM for inspection at any time.

A downhole motor directionally drills the well and increases penetration rate. The motor is powered by drilling fluids that are used to drive the motor, cool the bit, and carry drill cuttings to the surface. Conventional water-based drilling mud/fluids and non-toxic additives like walnut shells, saw dust, and barite clay would be utilized in the drilling of the wells to maintain borehole stability, minimize possible damage to the formation, provide adequate carrying viscosity (thickness) to carry the drill cuttings out of the wellbore, and reduce downhole fluid losses.

For the directional wells, an S-shaped directional design would be used to reach the targeted downhole well locations. In general, a target radius of 50 feet would be used. Specific directional plans for each well would be included with the APDs. Downhole operations would be done with directional tools to facilitate proper direction and path of the well. The actual bottom-hole locations would be horizontally separated from the surface pad positions up to 2,500 feet.

Drill cuttings from the wellbore (mainly shale, sand, and miscellaneous rock minerals) would be directed to a cuttings trench and eventually stacked, spread, or buried on location or incorporated into the reclamation of the pad.

After drilling the bore to its total depth, logging tools would be run into the well to evaluate the potential hydrocarbon resource. If the evaluation indicates adequate hydrocarbon resources are present and recoverable, steel production casing would be run and cemented in place in accordance with the well design. The proposed casing and cementing program would be designed to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. BLM approval is necessary prior to the use of any isolating medium other than cement.

Drilling rig engines would be muffled in accordance with Federal and State laws to minimize noise. Generator-driven lights would be installed on the rig substructure and mast to light each well pad for night drilling and safety of workers. To the extent possible, all lights would be oriented inward and downward to minimize impact to offsite locations.

Once a well has been drilled and cased, completion operations would begin. Well completion consists of running a cement bond log to evaluate the cement integrity and to correlate the cased hole logs to the open hole logs, perforating the casing across the hydrocarbon producing zones, and stimulating the formation to enhance the production of oil and gas. The typical method used for stimulation consists of hydraulic fracture treatment of the reservoir, in which sand and fluids are pumped into the producing formation with sufficient hydraulic pressure to fracture the rock formation. The sand serves as a proppant to keep the fractures open, allowing reservoir fluids to move more efficiently into the wellbore.

The next phase would be to flow and test the wells to determine rates of production. A completion pit may be constructed on each pad, or centrally located, to store water for frac operations and as a repository for flowback fluids. The need for and construction details of completion pits would be addressed in the APDs submitted to BLM and COGCC. Completion pits would be designed to maintain at least 2 feet of freeboard and would be constructed and operated in accordance with BLM and COGCC requirements. Spoil from the pits would be stockpiled within a drainage control berm along the edge of each pit and adjacent to the edge of each well pad. Flow tests would continue at each well until such time as ultimate well productivity and production characteristics can be determined. Testing would require the installation of a wellhead, test meter, separator, and tank battery at each well.

Well effluent during flowback and cleanout operations prior to encountering hydrocarbon gas of salable quality or significant volumes of condensate would be directed to tanks such that oil or condensate volumes shall not be allowed to accumulate in excess of 20 barrels (bbls) and would be removed within 24 hours. The gaseous phase of non-flammable effluent may be directed to a flare pit or vented from tanks for safety purposes until flammable gas is encountered. Well effluent containing more than 10 bbls per day of condensate or within 2 hours after first encountering hydrocarbon gas of salable quality would be directed to a combination of sand traps, separators, surge vessels, and tanks or other equipment as needed to ensure safe separation of sand, hydrocarbon liquids, water, and gas and to ensure salable products are efficiently recovered for sale or conserved and that non-salable products are disposed of in a safe and environmentally responsible manner.

If technically feasible and safe, closed-top tanks would utilize backpressure systems that exert a minimum of 4 ounces of backpressure and a maximum that does not exceed the pressure rating of the tank to facilitate gathering and combustion of tank vapors. Vent/backpressure values, the combustor, lines to the combustor, and knock-outs would be sized and maintained so as to safely accommodate any surges the system may encounter.

All salable quality natural gas would be directed to the sales line as soon as practicable or shut in and conserved. Temporary flaring or venting would be conducted as a safety measure during upset conditions and in accordance with all other applicable laws, rules, and regulations.

A flare pit would be constructed a minimum of 110 feet from each wellhead and would be used, as necessary, during completion work. In the event a flare pit proves to be unworkable for a specific well, a flare stack would be installed. The fluid would then either be returned to the pit or placed in a tank. Natural gas would be directed into the flare pit or flare stack with a constant source of ignition until either shut-in or flowlines and pipelines are constructed, and natural gas is directed into the gathering system. Flare lines would be directed as required by regulations and to avoid environmental damage. A deflector and/or directional orifice would be used to safeguard both personnel and the adjacent environment.

Approximately 2,500 to 3,000 bbls of fresh water would be used during the drilling of each well, with approximately 600 bbls recovered and reused for subsequent drilling or cementing operations. Well completion would require approximately 8,000 bbls of water per stage, with an average of 9.5 stages per well. During flowback and production, approximately 60 percent of the water used for well completion would be recovered and would be reused for subsequent completions. BBC has developed a comprehensive water management system that allows the efficient recycling and reuse of water and transportation of water to each well pad via pipelines. This system significantly reduces truck traffic associated with hauling water and results in all recycled water being used for well completions.

2.1.6 Well Completion and Production

Surface Facilities

Surface facilities at each pad location would consist of wellheads, separation units, gas metering units, fugitive emission combustors, radio antennas, solar panel brackets, chemical storage containers less than 500 gallons in capacity, and above-ground condensate and produced water tanks with approximately 300- to 500-bbl capacities each. Telemetry equipment may be used where feasible to remotely monitor well conditions. If conditions dictate their use, it is possible that plunger lift, gas lift, or other artificial lift systems would be installed. Multi-well locations would share production equipment, whenever feasible, to minimize surface occupancy and disturbance. All facilities would be located on the well pad or spaced appropriately in accordance with BLM recommendations. All production equipment located on, or associated with the development of Federal leases would be painted to match the surrounding terrain and located to reasonably minimize visual impact. The BLM would select the color for these facilities, including containment barriers, at each site. The production equipment would be fenced to prevent contact with wildlife/livestock. Telemetry equipment would be used where feasible to remotely monitor well conditions. The use of telemetry equipment would minimize traffic to and from the well locations.

Tank batteries would be placed within secondary containment to prevent the offsite migration of accidentally spilled condensate or produced water. Secondary containment would consist of corrugated steel containment rings. Construction of the containment rings surrounding the tank batteries would be conducted to prevent lateral movement of fluids through an impermeable liner attached to the rings and laid under the tanks. Secondary containment would be sized to contain a minimum of 110 percent of the

storage capacity of the single largest tank within the barrier. All loading lines would be placed inside the containment barrier or would have secondary containment vessels.

BBC does not foresee the need for compressor stations to serve the Gibson Gulch area. If needed, small compression units may be located on the pad to assist with gas pressure and collection. These units would be housed and muffled to mitigate any potential noise impacts to the surrounding project area.

All site security guidelines would be followed as identified in 43 CFR 3162.7-5 and Onshore Oil and Gas Order No. 3. All permanent structures would be painted a flat, non-reflective standard environmental color as determined by the BLM. Facilities would be painted within 6 months of being located onsite. As required by the Occupational Safety and Health Administration, some equipment would not be painted for safety considerations (i.e., some parts of equipment would retain its safety coloration such that it does not blend with the surroundings).

Gas and Water Gathering

Several new gas and water gathering pipelines would be added to the existing pipeline network. The new pipelines would generally be buried adjacent to the new access roads, but in limited situations, cross-country pipelines may be constructed. If excessive rock is encountered during construction, blasting may be necessary for pipeline installation. Construction of the pipelines would follow construction of the new roads in a planned sequence. To the extent possible, all vehicles and trenching equipment would use the road as part of the construction ROW. The pipeline alignment would first be cleared of vegetation remaining after road construction. The pipeline trench would be excavated mechanically to a depth that would allow approximately 4 to 5 feet of earth to be placed on top of the pipeline. Pipe segments would then be welded together, lowered into the trench, tested, and covered with excavated material.

After construction, pipelines would be tested with freshwater, nitrogen gas, and/or compressed air to locate any leaks. Freshwater or nitrogen used for testing would be obtained offsite. After testing, the water would be disposed of or discharged with the appropriate BLM and State of Colorado approvals and/or permits. If nitrogen or air is used, it would be released to the atmosphere. Generally, 1 mile of pipeline would be constructed in approximately 6 to 8 weeks and take approximately 15 workers.

Fluid Management

During the completion phase, all “frac” flowback water would be contained in temporary tanks or lined completion pits during completion operations and would be recycled for re-use, or piped or trucked offsite to an approved disposal facility. Flowback water would be recycled for use in drilling and completion operations, properly disposed of, or treated and recycled.

During the long-term production phase, multiple 300- to 500-bbl steel tanks would be installed on the well pad or offsite facilities to capture produced water. These tanks would be onsite for the life of the wells. Produced water may be recycled for use in drilling and completion operations, or piped or trucked offsite to approved disposal facilities. Typically, a well pad with 16 wells would require 8 to 10 tanks for storage of fluids. Two to three of these tanks would store produced water, with the remainder storing condensate. Although BBC would install water pipelines to each well pad to transport water, onsite tanks are still required for storage for those instances when pipeline/storage constraints, pipeline maintenance or other conditions limit the ability to transport water via these pipelines. Condensate would be collected at the well site in steel storage tank(s) and transported to market by tanker trucks.

2.1.7 Interim Reclamation

After well completion activities are finalized, BBC would reduce the size of the well pad to the minimum surface area needed for production facilities and future workovers, while providing for reshaping and stabilization of cut and fill slopes. In brief, interim reclamation would be accomplished by grading, leveling, and seeding, as recommended by the BLM or landowner. Interim reclamation would reduce the disturbed area at each pad to approximately 2 acres or less after well development.

The following is a summary of interim reclamation activities BBC would implement after all wells have been completed on a location:

- The well location and surrounding areas(s) would be cleared of all debris, materials, and trash not required for production. Waste materials would be disposed of at an appropriate disposal facility.
- All pits, cellars, rat holes, and other bore holes at drilling locations unnecessary for further lease operations would be back filled to conform to surrounding terrain after the drilling rig is released.
- All drill cuttings would be buried in the onsite pit, buried in an onsite cuttings trench, and/or incorporated into reclamation activities in accordance with COGCC rules.
- Areas not necessary for production and future workovers would be reshaped to resemble the original landscape contour. Stockpiled topsoil would be redistributed and disked on the area to be reclaimed and reseeded according to BLM requirements or recommendations.

Interim reclamation of that portion of the well pads and access roads not needed for production facilities/operations would be reclaimed within 6 months from the date of well completion, weather permitting. In the event that subsequent drilling operations would be commenced on a location within 12 months, temporary (pre-interim) reclamation would be performed to stabilize the location and minimize dust and erosion to the extent practicable. Interim revegetation/reseeding would take place as soon as practicable from the date of well completion. Dry/non-producing well locations would be plugged, abandoned and reclaimed within 6 months of well completion, weather permitting.

Some locations would require the use of special reclamation practices to ensure an adequate seedbed, reduce of erosion, and/or detain precipitation and runoff to enhance soil moisture. These measures could include use of soil amendments, special mulching requirements, straw mats, contour furrowing, or pocking of the soil. All reclamation efforts would employ seed mixes approved by the BLM or, if on private land, the landowner.

2.1.8 Workovers and Re Completions

Periodically, workover or re completion of a well may be required to ensure efficient production is maintained. Workovers can include repairs to the well bore equipment (casing, tubing, rods, or pump), the wellhead, or the production facilities. These repairs would usually be completed during daylight hours. The frequency of this type of work cannot be accurately projected because workovers vary from well to well. In the case of multi-well pads, space for equipment would be limited to the “in-use” area of the surface location, although it is possible that interim reclamation could be delayed by work-over operations. In the case of a well re completion, a water completion pit may have to be constructed.

2.1.9 Final Abandonment and Reclamation

Well and Pipeline Plugging and Abandonment

Upon abandonment, each well would be plugged with cement and its related surface equipment would be removed. Subsurface pipelines would be plugged at specific intervals and site contouring would be accomplished using appropriate heavy equipment. All disturbed surface soil would be reseeded with native vegetation. The seed mix used would conform to the typical vegetation surrounding the specific well site and would be approved by the BLM or private landowner.

A Sundry Notice would be submitted by BBC to the BLM describing the technical or environmental aspects of final plugging and abandonment. This notice would describe final reclamation procedures and any mitigation measures associated with the final reclamation performed by the operator. The BLM and COGCC standards for plugging would be followed. A configuration diagram, a summary of plugging procedures, and a job summary with techniques used to plug the well bore (e.g., cementation) would be included in the Sundry Notice.

Final Reclamation

All surface disturbances would be recontoured and revegetated according to an approved reclamation plan. Final well site reclamation would be performed and monitored in accordance with the 1998 Glenwood Springs Resource Area (GSRA) reclamation policy, including control of noxious weeds. Further information on reclamation standards is available in Appendix I of the 1999 Oil and Gas Leasing and Development Environmental Impact Statement (EIS). One of the basic goals of the policy is to “establish desirable (seeded and native) vegetation to set the stage for the natural process to restore the site.” Consequently, one of the goals in this proposal is to accomplish as much reclamation on each well pad during the life of the well as possible, even on those pads with a large final reclamation or “in -use” area. Unreclaimed areas or reclaimed areas that do not meet the objective of 3 to 4 years of sustained reclamation (known as “operator complete”) would undergo the reclamation re-treatment measures described in the Surface Use Plan of Operations (SUPO), submitted as part of the GGIIMDP, and referenced with each APD. BBC would also meet BLM bonding requirements for abandonment and reclamation.

BBC would restore the well locations and access roads to approximately their original contours. During reclamation of these sites, fill material would be pushed into cuts and up over the back slope. No large depressions would be left that would trap water or form ponds. Upon completion of backfilling, leveling and recontouring, the stockpiled topsoil would be evenly spread over the reclaimed areas. All disturbed surfaces would be re-seeded with an approved seed mixture. The seedbed would then be prepared by disking and roller packing following the natural contours. Seed would be drilled on contours at a depth no greater than 0.5 inch. In areas that cannot be drilled, seed would be broadcast at double the seeding rate and harrowed into the soil. Certified weed-free seed would be used, per BLM policy. If the seeding is unsuccessful, BBC would be required to make subsequent seedings.

2.1.10 Road Maintenance

The access roads would be inspected by the BLM and, if necessary, maintained by BBC on an as-needed or quarterly basis (at a minimum) to include such items as:

- road surface grading and graveling
- relief ditch, culvert, and cattle guard cleaning

- erosion control measures for cut-and-fill slopes and other disturbed areas
- road closures in periods of excessive soil moisture to prevent excessive rutting caused by vehicular traffic
- road and slope stabilization measures as required until final abandonment and reclamation
- weed control
- dust abatement techniques and frequency as approved by the BLM

2.1.11 Lease Stipulations and Mitigation

Table 3 outlines the stipulations attached to each lease, consisting of Timing Limitations (TLs), or seasonal restrictions, intended to protect seasonally sensitive wildlife uses, including use by deer and elk of winter range and nesting by raptors (birds of prey).

Table 3. Summary of Lease Stipulations within the GGIIMDP Area			
<i>Lease</i>	<i>Description of Lands</i>	<i>Pad</i>	<i>Lease Stipulations</i>
COC46972 Year: 1988	T6S, R91W, 6 th P.M., Garfield County, CO Section 29: E2E2, NWNE, SWSE Section 32: E2, NENW	MDP 24	TL: No surface use is allowed from January 16 through April 29. This stipulation does not apply to operation and maintenance of production facilities. For the purpose of protecting important seasonal wildlife habitat.
COC50126 Year: 1989	T6S, R91W, 6 th P.M., Garfield County, CO Section 19: N2, N2S2, Section 20: NWNW, S2NW, N2SW, SESW, W2SE, SWNE Section 21: W2NW	MDP 21 MDP 22 MDP 23	TL: No surface use is allowed from January 16 through April 29. This stipulation does not apply to operation and maintenance of production facilities. For the purpose of protecting critical deer and elk winter ranges.
COC50126 Year: 1989	T6S, R91W, 6 th P.M., Garfield County, CO Section 19: N2, N2S2 Section 20: NWNW, S2NW, N2SW, SESW, W2SE, SWNE Section 21: W2NW	MDP 21 MDP 22 MDP 23	TL: No surface use is allowed from April 2 through August 30. This stipulation does not apply to operation and maintenance of production facilities. For the purpose of protecting raptor nesting areas.
COC51440 Year: 1990	T6S, R91W, 6 th P.M., Garfield County, CO Section 33: N2NW, SWNW	MDP 24	TL: No surface use is allowed from January 16 through April 29. This stipulation does not apply to operation and maintenance of production facilities. For the purpose of protecting critical deer and elk winter ranges.
COC66718 Year: 2003	All lands in the lease	MDP 26	TL: No surface use is allowed from December 1 through April 30. This stipulation does not apply to operation and maintenance of production facilities. For the purpose of protecting critical deer and elk winter ranges.

BBC anticipates requesting year-round drilling operations to allow more efficient and less protracted development the project. For this to occur, BBC would be required to seek, and receive, the granting of TL exceptions by the BLM. The annual requests for winter TL exceptions would be evaluated by the BLM in collaboration with Colorado Parks and Wildlife (CPW) on the basis of four principal criteria:

- overall benefit to wintering big from allowing winter drilling in conjunction with habitat treatments and other measures proposed by BBC

- absence of significant adverse impacts on wintering wildlife
- the degree to which BBC has fulfilled its prior mitigation commitments

BBC's stated need for year-round drilling in the ensuing winter season. Absent the granting by BLM of an exception for any given winter season, the TL stipulation would prohibit construction, drilling, and completion activities during the specified period, requiring BBC to suspend these activities until after the end of the TL period.

To minimize impacts to nesting raptors, BBC would be required to conduct a raptor nesting survey to search for active or other nests within 0.25 mile of a pad or other surface facility. If a nest is found, a TL would be applied to prohibit the initiation of construction, drilling, or completion activities during a 60-day COA period selected based on the particular raptor species. For the MDP 21, 22, and 23 well pads, a 5-month TL stipulation is attached to the lease, indicating that nest sites had already been identified in the area as of the date of leasing. Regardless of whether the raptor nesting TL is applied to individual components as a 60-day COA or a 5-month stipulation, provisions exist for the annual granting of exceptions if the nest is not active or no longer exists or the location of the project relative to the nest is unlikely to result in adverse impacts. An exception may also be granted if project activities planned within the 0.25-mile buffer for a nest are initiated outside the nesting season and continue into the nesting season at the same location and approximate intensity.

2.2 No Action Alternative

The Proposed Action involves Federal subsurface minerals encumbered with Federal oil and gas leases that grant the lessee a right to explore and develop the leases. Although BLM cannot deny the right to drill and develop the leasehold, individual APDs can be denied to prevent unnecessary and undue degradation. The No Action Alternative constitutes denial of the APDs associated with the Proposed Action. Under the No Action Alternative, the Federal wells proposed and described in the Proposed Action would not be drilled.

2.3 Land Use Plan Conformance Review

The Proposed Action and No Action Alternative are subject to and have been reviewed for conformance with the following plan (43 CFR 1610.5, BLM 1617.3):

Name of Plan: The current land use plan is the *Glenwood Springs Resource Management Plan* (RMP), approved in 1984 and revised in 1988 (BLM 1984). Relevant amendments include the *Oil and Gas Plan Amendment to the Glenwood Springs Resource Management Plan* (BLM 1991) and the *Oil & Gas Leasing & Development Record of Decision and Resource Management Plan Amendment* (BLM 1999a).

Decision Language: The 1991 Oil and Gas Plan Amendment (BLM 1991) included the following at page 3: "697,720 acres of BLM-administered mineral estate within the Glenwood Springs Resource Area are open to oil and gas leasing and development, subject to lease terms and (as applicable) lease stipulations" (BLM 1991, page 3). This decision was carried forward unchanged in the 1999 ROD and RMP amendment at page 15 (BLM 1999b): "In areas being actively developed, the operator must submit a Geographic Area Proposal (GAP) [currently referred to as a Master Development Plan, MDP] that describes a minimum of 2 to 3 years of activity for operator controlled leases within a reasonable geographic area" (BLM 1999a).

Discussion: The Proposed Action is in conformance with the 1991 and 1999 RMP amendments cited above because the Federal mineral estate proposed for development is open to oil and gas leasing and

development. The 1999 RMP amendment requires multi-year development plans known at that time as GAPS for lease development over a large geographic area. The Proposed Action, as such, is in conformance with the exception to the requirement to require operators to submit MDPs, previously known as GAPS.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

During its internal scoping process for this Environmental Assessment (EA), pursuant to the National Environmental Policy Act (NEPA), BLM resource specialists identified the following elements of the natural and human environment as present in the project vicinity and potentially affected by the project:

Access and Transportation	Range
Air Quality	Recreation
Cultural Resources	Socioeconomics
Fossil Resources	Soils
Geology and Minerals	Special Status Species
Invasive Non-Native Plants	Vegetation
Migratory Birds	Visual Resources
Native American Religious Concerns	Wastes, Hazardous and Solid
Noise	Water Quality, Surface and Ground
Prime and Unique Farmland	Wildlife, Aquatic and Terrestrial

3.1 Access and Transportation

Affected Environment

The primary light vehicle access route to the Gibson Gulch area is as follows: After exiting I-70, proceed to the frontage road (River Frontage Road) at the south end of the Silt/I-70 interchange; proceed in a general easterly direction along this River Frontage Road 0.4 miles to the intersection with County Road 311 (CR 311); turn right and follow CR 311 in a general southerly direction crossing the Colorado River and continue 0.6 mile to the intersection with CR 331; turn left and follow CR 311 in a general easterly direction for 1.4 miles to the intersection with CR 335. Turn right at the intersection of CR 311 and CR 335, and follow CR 311 in a general southeasterly direction along Divide Creek approximately 3 miles to an existing private gravel road on the left. To reach MDP 21, proceed left for approximately 2.5 miles traveling over private surface to the project area (Figure 2). To reach MDP 22 and 23, proceed east on CR 311 to intersection with CR 335 at Divide Creek, then south on CR 311 1.3 miles to intersection with a private road on the left (Williams/Jolley Road), then east approximately 1 mile to an intersection with an unnamed oil and gas road, and proceed in the direction of the Williams KP 34-18 pad. Proceed south approximately 0.25 mile to the BLM property boundary and continue south approximately 1 mile to the MDP 23 pad.

To reach MDP 24, 25, and 26 pads, proceed south on CR 311 in a general southeasterly direction along Divide Creek approximately 2.5 miles, traveling through private lands, and turn left on the gravel access road which leads into the project area. Proceed left in a general easterly direction approximately 4.5 miles to the GGMDP 4 pad, then proceed along the access road approximately 1.2 miles to the MDP 24 pad (Figure 3). There is currently a proposal between Antero Resources Piceance Corporation (“Antero”) and BBC to share a segment of road that was analyzed in the Antero North Castle Springs MDP. This portion of road would eliminate approximately 0.5 mile of additional road disturbance in Section 33.

The primary heavy vehicle access route would be defined by Garfield County heavy haul vehicle routes. The current (June 2011) heavy haul route to the project area is as follows: Exit I-70 at the Rifle Municipal

Airport Exit (Exit 94). After exiting I-70, proceed to the frontage road (CR 346) at the south end of the Airport/I-70 interchange. Proceed in a general easterly direction along CR 346 for 3 miles to the intersection with CR 331/Dry Hollow Rd. Turn right and follow CR 331 for 6.75 miles in a general southerly direction to the intersection with CR 324/ Maxfield Road. Turn left onto CR 324 and follow CR 324 in a general easterly direction for 2.4 miles to the intersection with CR 311. Turn left at the intersection of CR311 and CR 324 and follow CR 311 in a general northerly direction for approximately 3.3 miles to the intersection with a gravel road that enters the project area on the right (Figure 1).

Environmental Consequences

Proposed Action

Within the project area, the road network would be extended from existing and proposed roads to provide access to the proposed pad locations. The extension of the road network would involve construction and improvement of approximately 3.2 miles of new roads and would utilize approximately 8 miles of existing oil and gas lease roads. The Proposed Action would result in a substantial increase in truck traffic related to the development of the 88 wells. The largest increase would be during rig-up, drilling, and completion activities. Data indicate that approximately 1,160 truck trips over a 30-day period would be required to support the drilling and completion of each well (Table 4). Once the wells are producing, traffic would decrease to occasional visits for monitoring or maintenance activities. Each well may have to be recompleted once per year, requiring three to five truck trips per day for approximately 7 days.

<i>Vehicle Class</i>	<i>Trips per Well</i>	<i>Percentage of Total</i>
16-wheel tractor trailers	88	7.6%
10-wheel trucks	216	18.6%
6-wheel trucks	452	39.0%
Pickup trucks	404	34.8%
Total	1,160	100.0%
Source: BLM 2006. Note: Trips by different vehicle types are not necessarily distributed evenly during the drilling process. Drilling and completion period is approximately 30 days per well.		

Degradation of field development roads may occur due to heavy equipment travel and fugitive dust and noise would be created. Mitigation measures (Appendix A) would be required as COAs to ensure adequate dust abatement and road maintenance occur.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

3.2 Air Quality

Affected Environment

Colorado Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS) are health-based criteria for the maximum acceptable concentrations of air pollutants in areas

of public use. Although specific air quality monitoring has not been conducted within the project area, regional air quality monitoring has been conducted in Rifle and elsewhere in Garfield County. Air pollutants measured in the region for which ambient air quality standards exist include carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), ozone (O₃), particulate matter less than 10 microns (μ) in diameter (PM₁₀), and particulate matter less than 2.5 μ in diameter (PM_{2.5}).

The project area lies within Garfield County, which has been described as an attainment area under CAAQS and NAAQS. An attainment area is an area where ambient air pollution quantities are below (i.e., better than) NAAQS standards. As shown in Table 5, regional background values are well below established standards, and all areas within the cumulative study area are designated as attainment for all criteria pollutants. Federal air quality regulations are enforced by the Colorado Department of Public Health and Environment (CDPHE). The Prevention of Significant Deterioration (PSD) program within CDPHE is designed to limit incremental increases for specific air pollutant concentrations above a legally defined baseline level, as defined by an area’s air quality classification. Incremental increases in PSD Class I areas are strictly limited, while increases allowed in Class II areas are less strict.

Table 5. Air Pollutant Background Concentrations, Colorado and National Ambient Air Quality Standards, and Prevention of Significant Deterioration Increments.					
<i>Pollutant/Averaging Time</i>		<i>Measured Background</i>	<i>CAAQS/or NAAQS</i>	<i>Incremental Increase Above Legal Baseline</i>	
				<i>Class I</i>	<i>Class II</i>
Carbon Monoxide (CO) ¹	1-hour	4,656 μg/m ³	40,000 μg/m ³ (35 ppm)	n/a	n/a
	8-hour	2,328 μg/m ³	10,000 μg/m ³ (9 ppm)	n/a	n/a
Nitrogen Dioxide (NO ₂) ²	Annual Arithmetic Mean	0.016 ppm	0.053 ppm	2.5 μg/m ³	25 μg/m ³
Ozone ¹	8-hour	0.065 ppm (Rifle)	0.075 ppm	n/a	n/a
Particulate Matter (PM ₁₀) ³	24-hour	67 μg/m ³ (Rifle)	150 μg/m ³	8 μg/m ³	30 μg/m ³
	Annual	25.7 (Rifle)	50 μg/m ³	4 μg/m ³	17 μg/m ³
Particulate Matter (PM _{2.5}) ¹	24-hour	34.5 μg/m ³ (GJ)	35 μg/m ³	2 μg/m ³	9 μg/m ³
	Annual	9.3 μg/m ³ (GJ)	15 μg/m ³	1 μg/m ³	4 μg/m ³
Sulfur Dioxide (SO ₂) ⁴	3-hour	66.7 μg/m ³	700 μg/m ³ (0.27 ppm) ⁵	25 μg/m ³	512 μg/m ³
	24-hour	34.6 μg/m ³	365 μg/m ³ (0.14 ppm)	5 μg/m ³	91 μg/m ³
	Annual	5.3 μg/m ³	80 μg/m ³ (0.03 ppm)	2 μg/m ³	20 μg/m ³

¹ Background data collected in Rifle, 2010 (Chick 2011)
² Background data collected by Encana at site north of Parachute, 2007 (CDPHE 2008)
³ Background data collected in Grand Junction, 2010 (Chick 2011)
⁴ Background data collected at Unocal site, 1983-1984 (CDPHE 2008).
⁵ Colorado 3-hour AAQS = 700 μg/m³.

The project area and surrounding areas are classified as PSD Class II. The PSD Class I areas located within 100 miles of the project area are Flat Tops Wilderness (approximately 25 miles north), Maroon Bells – Snowmass Wilderness (approximately 35 miles south), West Elk Wilderness (approximately 60 miles southeast), Black Canyon of the Gunnison National Monument (approximately 65 miles south), and Eagles Nest Wilderness (approximately 60 miles east). Dinosaur National Monument (approximately 80 miles northwest) is listed as a Federal Class II area but is regulated by CDPHE as a Class I area for SO₂. Regional background pollutant concentrations and applicable standards or limits are listed in Table 5.

Environmental Consequences

Proposed Action

The CDPHE, under its EPA-approved state implementation plan, is the primary air quality regulatory agency responsible for determining potential impacts once detailed industrial development plans have been made; those development plans are subject to applicable air quality laws, regulations, standards, control measures, and management practices. CDPHE has the ultimate responsibility for reviewing and permitting any project's air quality impacts prior to its operation. Unlike the conceptual "reasonable but conservative" engineering designs used in NEPA analyses, any CDPHE air quality preconstruction permitting required would be based on site-specific, detailed engineering values, which would be assessed in CDPHE's review of the permit application.

The GGIIMDP includes constructing, drilling, completing and operating up to 88 new wells over an estimated 5 years. Although the impacts to air quality from these wells are disclosed in this MDP, the drilling and operation is permitted with the approval of an APD for each well. Individual wells would require approximately 5-7 days to drill and approximately 5 to 15 days to complete. Air quality would decrease during construction of access roads, pads, and pipelines and drilling and completing the wells. Pollutants generated during construction activities would include combustion emissions and fugitive dust associated (PM₁₀ and PM_{2.5}) with construction equipment and vehicles. Construction activities for the well pad, access road, and pipelines would occur between the hours of 7:00 a.m. and 6:00 p.m. each day. Once construction activities are complete, air quality impacts associated with these activities would also cease. Fugitive dust from mobilization and rigging up the drill rig would also occur however impacts associated would be minor and short lived. Emissions associated with drilling and completing the wells would also be greatly reduced to emissions associated with long term natural gas and condensate production.

A regional air model addressing air quality impacts of current and future oil and gas activities within the CRVFO has recently been completed for the BLM by Tetra Tech, Inc. and its subcontractor, URS Corporation. The methods and results of that modeling are presented in an Air Resources Technical Support Document (ARTSD) (BLM 2011). The air quality model addressed impacts associated with emissions of greenhouse gases (GHGs), "criteria pollutants" (CO, NO₂, SO₂, ozone, PM₁₀, and PM_{2.5}), hazardous air pollutants (HAPs) including BTEX (benzene, ethylbenzene, toluene, and xylenes), formaldehyde, and n-hexane. The modeling also addressed potential impacts on visibility due to particulates and "photochemical smog" (caused by chemical reactions in the atmosphere) and on lake chemistry of selected pristine lakes due to modeled deposition rates of sulfur and resultant impacts on acid neutralizing capacity of the lake waters. The visibility analysis predicted a slight impact (one day per year with a reduction in visibility of 1deciview or greater) in the Flat Tops Wilderness and no days with 1 deciview or greater reduction in visibility at all other modeled Class I and II receptors. For the remaining pollutants analyzed, modeled levels of future oil and gas development within the CRVFO would have no or negligible long-term adverse impacts on air quality. Since the Proposed Action is within the scope of the future development modeled, no significant adverse impacts on air quality are anticipated.

The air quality model incorporated assumptions about various development and mitigation scenarios, many of which have been integrated into the Proposed Action by BBC or would be imposed by the BLM as COAs (Appendix A). These include use of directional drilling to reduce the number of well pads, piping instead of trucking of fluids to a centralized collection facility, flaring instead of venting of natural gas during well completions, self-contained flare units to minimize emissions to the atmosphere, and use of closed-loop drilling. Closed-loop drilling minimizes emissions by recycling drilling muds and separating fluids and drill cuttings, thus eliminating open pits containing petroleum fluids. In addition to minimizing emissions associated with drilling and completion activities, these mitigation measures would

also significantly reduce fugitive dust and vehicle tailpipe emissions by greatly reducing the volume of truck traffic required to support the operations.

Generation of fugitive dust as a result of construction activities and travel on unpaved access roads would be further reduced by BLM's requirement that BBC apply gravel to a compacted depth of 6 inches on the access road, apply water to the access road during the development phase, and apply a dust suppressant surfactant approved by the BLM throughout the long-term production phase (Appendix A).

Emissions of volatile organic compounds (VOCs) such as the BTEX constituents of condensate vary depending on the characteristics of the condensate, the volume produced, and tank operations. Operators are required to control emissions of VOCs from condensate tanks under CDPHE Regulation 7. If deemed necessary by the State, BBC may be required to install a vapor recovery or thermal destruction system to further reduce VOC concentrations.

Ongoing scientific research has identified the potential impacts of "greenhouse gases" (GHGs) and their effects on global atmospheric conditions. These GHGs include carbon dioxide, methane, nitrous oxide, water vapor, and several trace gases. Through complex interactions on a global scale, these GHG emissions are believed by many experts to cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the Earth back into space.

In 2001, the Intergovernmental Panel on Climate Change (IPCC) predicted that by the year 2100, global average surface temperatures would increase 1.4 to 5.8°C (2.5 to 10.4°F) above 1990 levels. The National Academy of Sciences (NAS) supports these predictions, but has acknowledged that there are uncertainties regarding how climate change may affect different regions. In 2007, the IPCC also concluded that "warming of the climate system is unequivocal" and "most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic (man-made) greenhouse gas concentrations" (NAS 2007). Other theories about the effect of GHGs on global climate change exist.

The recent air modeling for the CRVFO inventoried and assessed GHG emissions associated with various scenarios of future oil and gas development. In all scenarios modeled, the GHG emissions would not increase the total US natural gas sector emissions by more than 0.5%. The lack of scientific tools designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts of climate change on the specific area of the Proposed Action. While any oil and gas development project may contribute GHGs to the atmosphere, these contributions would not have a significant effect on a phenomenon occurring at the global scale believed by some to be due to more than a century of human activities.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

3.3 Cultural Resources

Affected Environment

Six intensive (Class III) cultural resource inventories (CRVFO# 1111-21, 1111-11, 1110-14, 1108-4, 1104-3 and 591) have been conducted within the area of the Proposed Action, the majority of which were

completed recently by Grand River Institute of Grand Junction specifically for this project. The six inventories have identified five eligible sites and two potentially eligible sites within the project area, though outside any of the areas of potential effect. Therefore, no “historic properties” were identified as being within the area of the Proposed Action. “Historic properties” are cultural resources that are eligible or potentially eligible for inclusion on the National Register of Historic Places (NRHP). Additionally, 25 isolated finds have been recorded during the various inventories. Isolated finds are by definition not eligible to the NRHP.

Environmental Consequences

Proposed Action

The implementation of the Proposed Action would have no direct impacts to known “historic properties,” as none has been identified in the project’s area of potential effect. Consequently, the BLM made a determination of “**No Historic Properties Affected.**” This determination was made in accordance with the 2001 revised regulations [36CFR 800.4(d)(1)] for Section 106 of the National Historic Preservation Act (NHPA 16U.S.C 470f), the BLM/State Historic Preservation Officer (SHPO) Programmatic Agreement (1997) and Colorado Protocol (1998)]. Cultural resource types typically found in the surrounding areas include prehistoric open camps, lithic scatters, historic ditches, historic structures, historic trash scatters/dumps and isolated prehistoric and historic finds.

Although no known eligible sites are within the areas of potential effect, a rock art site (5GF4086) has been identified as being in the vicinity of a proposed pipeline and access road. The BLM has requested that the access road be relocated and the proponent has agreed. The proposed location of the pipeline cannot be readily relocated, though it has been moved as far away as practical. Safety fencing will delineate the extent of ground disturbing activity associated with the proposed pipeline installation in the direction of the site, while an archaeological monitor will observe the trenching and other pipeline construction activities in the vicinity. These monitoring/mitigation measures can be found in the site specific COAs. In addition, the standard Education/Discovery COA for cultural resource protection would be attached to the APDs as a COA (Appendix A). The importance of these COAs would be stressed to the operator and their contractors, including informing them of their responsibilities to protect and report any cultural resources encountered during construction operations.

Indirect, long-term cumulative impacts from increased access and the presence of project personnel could result in a range of impacts to known and undiscovered cultural resources in the vicinity of the project location. These impacts could range from accidental damage or vandalism to illegal collection and excavation.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

3.4 Fossil Resources

Affected Environment

The predominant bedrock formations present at or near the surface within the boundary of the GGIIMDP are the Wasatch Formation (including the Fort Union Formation or equivalent at its base) and the Ohio

Creek formation. Isolated areas of Quaternary gravels and alluvium, wind-blown loess, colluvium, and weathered volcanic boulders and gravel are interspersed throughout the MDP area and cover older Wasatch formation sediments. Occurring in varying thicknesses, these Quaternary sediments are considered Potential Fossil Yield Classification Class 2, defined as having a low probability of fossil occurrence. Class 2 geologic units are not likely to contain vertebrate or scientifically significant invertebrate fossils.

The Wasatch Formation is a BLM Condition 4 formation, defined as an area that is known to contain vertebrate fossils or noteworthy occurrences of invertebrate fossils. These types of fossils are known to occur or have been documented, but may vary in occurrence and predictability. The Wasatch Formation is divided into the early Eocene Shire, and the Paleocene age Molina and Atwell Gulch members. All members of the Wasatch Formation contain vertebrate fossils in varying abundances (Murphy and Daitch 2007). Rocks of the Wasatch Formation are lithologically very similar to one another throughout the Piceance Creek Basin as heterogeneous continental fluvial deposits with interfingering channel sandstone beds and overbank deposits consisting of variegated claystone, mudstone, and siltstone beds (Franczyk et al. 1990). Eocene mammals have been found in the lower part of the Shire member.

Fossils historically identified in the Wasatch are archaic mammals—including marsupials, representatives of two extinct orders of early mammals (pantodonts and creodonts), artiodactyls (deer-like, even-toed ungulates), ancestral horses and other perissodactyls (odd-toed ungulates), carnivores, and primates—as well as birds, lizards, turtles, crocodylians, gars and other fishes, freshwater clams, gastropods (snails), and other invertebrates (BLM 1999a).

Environmental Consequences

Proposed Action

Although mapped as the predominant surface formation of the GGIIMDP area, field inspection revealed the Wasatch exposed only in a few outcrops found on mesa sides and summits. The thickness of the Quaternary sediments cannot be accurately determined, but construction activities have the potential to adversely affect important fossils that may be present in the underlying Wasatch Formation. The greatest potential for impacts is associated with excavation of shallow bedrock that may be unearthed during well pad and facilities (especially pipeline) construction. In general, alluvium, colluvium, and other unconsolidated sediments are much less likely than bedrock to contain well-preserved fossils.

An examination of the BLM paleontology database indicates that there are no known fossil occurrences within the GGIIMDP boundary. The closest known site occurs in Section 15, T6S, R91W, more than 1 mile northeast of the proposed pads. Three additional sites are found northwest in Section 15, T6S, R92W, over 3 miles from the nearest proposed pad. Areas covered with vegetation and soil cover do not usually yield fossil resources, but inspections should be conducted for proposed facilities that are located on or within 200 feet of Wasatch Formation bedrock surface exposures. In the event paleontological resources are encountered, a standard paleontological COA would be attached to the APDs (Appendix A).

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area.

3.5 Geology and Minerals

Affected Environment

The project area is located near the eastern margin of the Colorado Plateau physiographic province (Fenneman 1946), a region characterized by dissected plateaus of strong relief. A broad, asymmetric, southeast-northwest trending structural basin, the Piceance Basin contains stratified sediments ranging in age from Cambrian through middle Tertiary up to 20,000 feet thick. The Basin lies between the White River uplift to the northeast, the Gunnison uplift to the south, and the Uncompahgre swell to the west (George 1927, Weiner and Haun 1960).

Bedrock exposed within the proposed development project is the Tertiary Wasatch Formation. The Wasatch Formation consists of variegated siltstone, claystone, and sandstones and ranges from 1,000 to 2,500 feet thick. The Wasatch Formation is underlain unconformably by the Mesaverde Group. The Mesaverde Group is composed of mudstones and sandstones with interlayered coal beds and ranges in thickness from about 3,000 to over 7,000 feet. The Mesaverde Group has also been referred to as the Mesaverde Formation, which includes informal subdivisions based on gas productivity characteristics.

In proposed development area, the Wasatch Formation is mantled by unconsolidated sedimentary surface deposits of Quaternary age in the form of colluvium. The thickness of these unconsolidated sediments is uncertain, but the depth to the underlying Wasatch Formation may be determined during construction excavation. Table 6 lists the geologic formations present within the proposed project area.

The Mesaverde Group is the target zone of the proposed drilling program. Comprised of the Williams Fork and Iles Formations, sediments of the Mesaverde Group are composed of marine sandstones and transitional to non-marine beds of coal, shale, and sandstone. These sediments were deposited marginal to the great Cretaceous seaway. The oscillating shoreline of this sea, due to the rise and fall of sea level, left behind a complex of transgressive and regressive sedimentary sequences of nearshore and offshore sediments that define the Mesaverde Group.

Table 6. Geologic Formations within the Study Area

<i>Map Symbol</i>	<i>Formation Name</i>	<i>Age</i>	<i>Characteristics</i>	<i>Location</i>
Qal	Quaternary alluvium deposits	Holocene	Chiefly silt, sand, and gravel	Flood plains, fans, and low terraces
Qgmf	Quaternary gravels and mud flow	Holocene	Young gravels, stream, terrace, and outwash gravels	Streams, flood plains and fans
Two	Wasatch Formation	Eocene, Paleocene	Red, gray and brown sandstone and siltstone and red, green and gray shale	Base of Mesas and predominant surface exposures both north and south of the Colorado River

Source: Donnell et al. 1989

Production is derived from three reservoir intervals, which include the Wasatch, Williams Fork, and Iles Formations. The latter two make up the Upper Cretaceous Mesaverde Group. The proposed drilling program would target the sandstone sequences of the Upper Williams Fork Formation, which provide most of the natural gas production volumes (Lorenz 1989). The upper portions of the Williams Fork include fluvial point bar, floodplain, and swamp deposits. The Lower Williams Fork Formation includes delta front, distributary channel, strandplain, lacustrine and swamp environments (Hemborg 2000), while the sandstones and coalbeds of the Iles Formation were deposited in a wave-dominated coastal setting (Johnson 1989, Lorenz, 1989). The source rocks are interbedded and thermally mature gas-prone shales,

mudstones, siltstones, and coals. The reservoir rocks are the fine to medium-grained Williams Fork sandstones, varying in thickness from less than 10 feet to more than 50 feet (Spencer and Wilson 1988), creating an interbedded relationship between source and reservoir. The trapping mechanism of the gas is both stratigraphic and diagenetic.

Environmental Consequences

Proposed Action

If the proposed wells are proven feasible, initial production rates would be expected to be highest during the first few years of production, then decline during the remainder of the economic lives of the wells. Substantial reserves have been known to be trapped within the tight sands of these reservoirs since the late 1950s, but only within the last decade, and particularly within the last few years, has the integrated application of new technologies turned the tight gas sands of the Mesaverde Group into a profitable play (Kuuskraa 1997). Natural fracture detection, advanced log analysis, more rigorous well completions and recompletions, and denser spacing have increased the amount of recoverable gas within these reservoirs.

Natural gas production from the proposed wells would contribute to the draining of hydrocarbon-bearing reservoirs within the Mesaverde Group in this area, an action that would be consistent with BLM objectives for mineral production. Hydraulic fracturing would be utilized to create fractures within the formation to allow gas production from the wells. Tight gas sands refer to low permeability sandstone reservoirs that produce primarily dry natural gas. Typically, these reservoirs cannot be produced at economic flow rates or volumes unless the well is stimulated by hydraulic fracture treatment (Holditch, 2006). The amount of natural gas that may be potentially produced can only be estimated based on production rates from nearby wells and adjacent fields. Reserves have been estimated to approach 2 billion cubic feet (bcf) of natural gas per well (Vargas and Davis, 2006).

Casing programs have been designed to specifically prevent hydrocarbon migration from gas-producing strata penetrated by the wellbore during drilling, initial production, and after completion of the well. Identification of potential fresh water bearing zones, aquifers, gas producing zones, and over- and under-pressured zones are incorporated into drilling scenarios for the proposed wells. Estimates of what depth these zones would be encountered are used to determine drilling fluids, fluid densities, surface casing depths, and production planning. If one of these identified zones is encountered during drilling, cement volumes will be adjusted to isolate that zone. This is designed to prevent accidental contamination or leakage of hydrocarbons or fracturing fluids into other productive zones within the wellbore.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

3.6 Invasive Non-Native Plants

Affected Environment

The southern half of the GGIIMDP is relatively free of invasive non-native species. A large infestation of houndstongue (*Cynoglossum officinale*) was found next to a stock pond by the proposed access road in Section 32. Houndstongue is a State-listed noxious weed in Colorado and is included on the "B List." Cheatgrass (*Anisantha tectorum*), a non-native annual grass and one of the most pernicious weeds in

disturbed or degraded areas of arid and semi-arid habitats throughout the region, was present but not dominant. Cheatgrass is on the State of Colorado's noxious weed "C List."

In the northern half of the GGIIMDP, cheatgrass was more extensive in the northern half of the GGIIMDP, including a dense cover of this weed and a weedy non-native annual forb, kochia (*Bassia scoparia*) on the MDP 21 pad site and along the associated access road. The vegetation on the MDP 22 and 23 pad locations was in generally better condition, with cheatgrass present but less dominant.

Environmental Consequences

Proposed Action

Surface-disturbing activities provide a niche for the invasion and establishment of invasive non-native species, particularly when these species are already present in the surrounding area. Because numerous invasive, non-native species are present in the project area, the potential for invasion following construction activities is high. Mitigation measures designed to minimize the spread of these species would be attached to well APDs as COAs (Appendix A).

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions

3.7 Migratory Birds

Affected Environment

The Migratory Bird Treaty Act (MBTA) includes native passerines (flycatchers and songbirds) as well as birds of prey, migratory waterbirds (waterfowl, wading birds, and shorebirds), and other species such as doves, hummingbirds, swifts, and woodpeckers. Within the context of the MBTA, "migratory" birds include non-migratory "resident" species as well as true migrants, essentially encompassing virtually all native bird species. For most migrant and resident species, nesting habitat is of special importance because it is critical for supporting reproduction in terms of both nesting sites and food. In addition, because birds are generally territorial during the nesting season, their ability to access and utilize sufficient food is limited by the quality of the territory occupied. During non-breeding seasons, birds are generally non-territorial, resulting in their feeding across a larger area and wider range of habitats.

Migratory bird species that are Federally listed under the Endangered Species Act of 1973, as amended, or classified by the BLM as sensitive species, are addressed under the section on Special Status Wildlife and Fish Species. The current section addresses migratory birds that may inhabit the proposed project area. Emphasizing the need to conserve declining species, the U.S. Fish and Wildlife Service (USFWS) has published a list of Birds of Conservation Concern (BCC) that warrant prompt conservation attention to stabilize or increase populations or to secure threatened habitats. This section also addresses species within the project area that listed by the USFWS as BCC species (USFWS 2008). This analysis focuses on BCC species, on non-BCC species that are Neotropical (long-distance) migrants, and raptors—three groups highly vulnerable to habitat loss or modification on their breeding grounds.

The project area is dominated by moderately dense pinyon-juniper woodlands interspersed with sagebrush meadows and small stands of scrub oak. The understory consists of montane shrubs and a variety of native grasses and forbs, along with an invasive non-native species, cheatgrass.

Numerous migratory bird species occupy, or have potential to occupy, the project area. Three species on the USFWS BCC list—the pinyon jay (*Gymnorhinus cyanocephalus*), juniper titmouse (*Baeolophus griseus*), and gray vireo (*Vireo vicinior*)—were reported as present in pinyon-juniper habitats during surveys of the project area (WestWater 2011). A fourth species, the golden eagle (*Aquila chrysaetos*), may occasionally hunt across the area.

Other migratory birds associated with pinyon-juniper woodland in the region and potentially present in the project area include Townsend's solitaire (*Myadestes townsendi*) and the blue-gray gnatcatcher (*Polioptila caerulea*) and neotropical migrants such as the broad-tailed hummingbird (*Selasphorus platycercus*), Say's phoebe (*Sayornis saya*), gray flycatcher (*Empidonax oberholseri*), mountain bluebird (*Sialia sialis*), plumbeous vireo (*Vireo plumbeus*), black-throated gray warbler (*Dendroica nigrescens*), chipping sparrow (*Spizella passerina*), lark sparrow (*Chondestes grammacus*), and lesser goldfinch (*Carduelis psaltria*). Cassin's finch (*Carpodacus cassinii*), a BCC species that nests primarily in higher elevations such as montane and subalpine forests, sometimes nests at lower elevations in pinyon-juniper and common winters at lower elevations such as the project area. Cassin's finches are reported to have been observed in the project area during nesting surveys of the project area (WestWater 2011).

Sagebrush habitats in the project area appear too limited to support nesting by a sagebrush-obligate migrant, Brewer's sparrow (*Spizella breweri*), and none was observed during site surveys. However, the sagebrush areas appear sufficient in extent to support nesting by the western kingbird (*Tyrannus vociferans*), western meadowlark (*Sturnella neglecta*), and vesper sparrow (*Pooecetes gramineus*), all of which utilize more general grassland and low shrubland habitats and are less strictly associated with sagebrush.

Oakbrush and mixed mountain shrub habitats in the area are suitable for neotropical migrants such as the common poorwill (*Phalaenoptilus nuttallii*), dusky flycatcher (*Empidonax oberholseri*), Virginia's warbler (*Vermivora virginiae*), MacGillivray's warbler (*Oporornis tolmiei*), spotted towhee (*Pipilo maculatus*), and lazuli bunting (*Passerina amoena*).

Raptors use the project area for nesting and hunting activities. Nesting habitat in the project vicinity consists primarily of pinyon-juniper woodlands. Species most likely to nest within or near the project areas include the American kestrel (*Falco sparverius*), sharp-shinned hawk (*Accipiter striata*), Cooper's hawk (*A. cooperi*), red-tailed hawk (*Buteo jamaicensis*), great horned owl (*Bubo virginiana*), and northern pygmy-owl (*Glaucidium gnoma*). Golden eagles, if present, would be infrequent visitors from nesting habitats on cliff bands in the general project areas. Golden eagles may travel considerable distances from nesting sites in search of prey.

Raptor surveys were conducted for the proposed well pad locations and associated access roads and pipelines. Six raptor nests discovered during previous raptor surveys in Section 33 were rechecked for occupancy status in conjunction with the GGIIMDP, and none appeared to be occupied during the 2011 nesting season. However, two new raptor nest sites were identified during the 2011 survey (Figure 4). One nest was located approximately 0.25 mile from the MDP 24 and MDP 25 pads. The other nest was located within the proposed road alignment and would be removed upon construction of the road. Both of the newly identified nests are consistent with the size and construction of *Accipiter* nests. Both nests showed evidence of fresh nest material having recently been added. Consequently, the two nests, shown on Figure 4 as UNAC-1 and UNAC-2 (for unknown *Accipiter*), are considered to have been active in 2011, although neither was documented as containing eggs or young (WestWater 2011).

One unoccupied cliff nest was identified approximately 0.2 mile from the MDP 23 pad and 0.25 mile from the MDP 21 pad (Figure 5). This nest, indicated as UNHA (for unknown hawk) was probably constructed by a red-tailed hawk, based on its size and position.

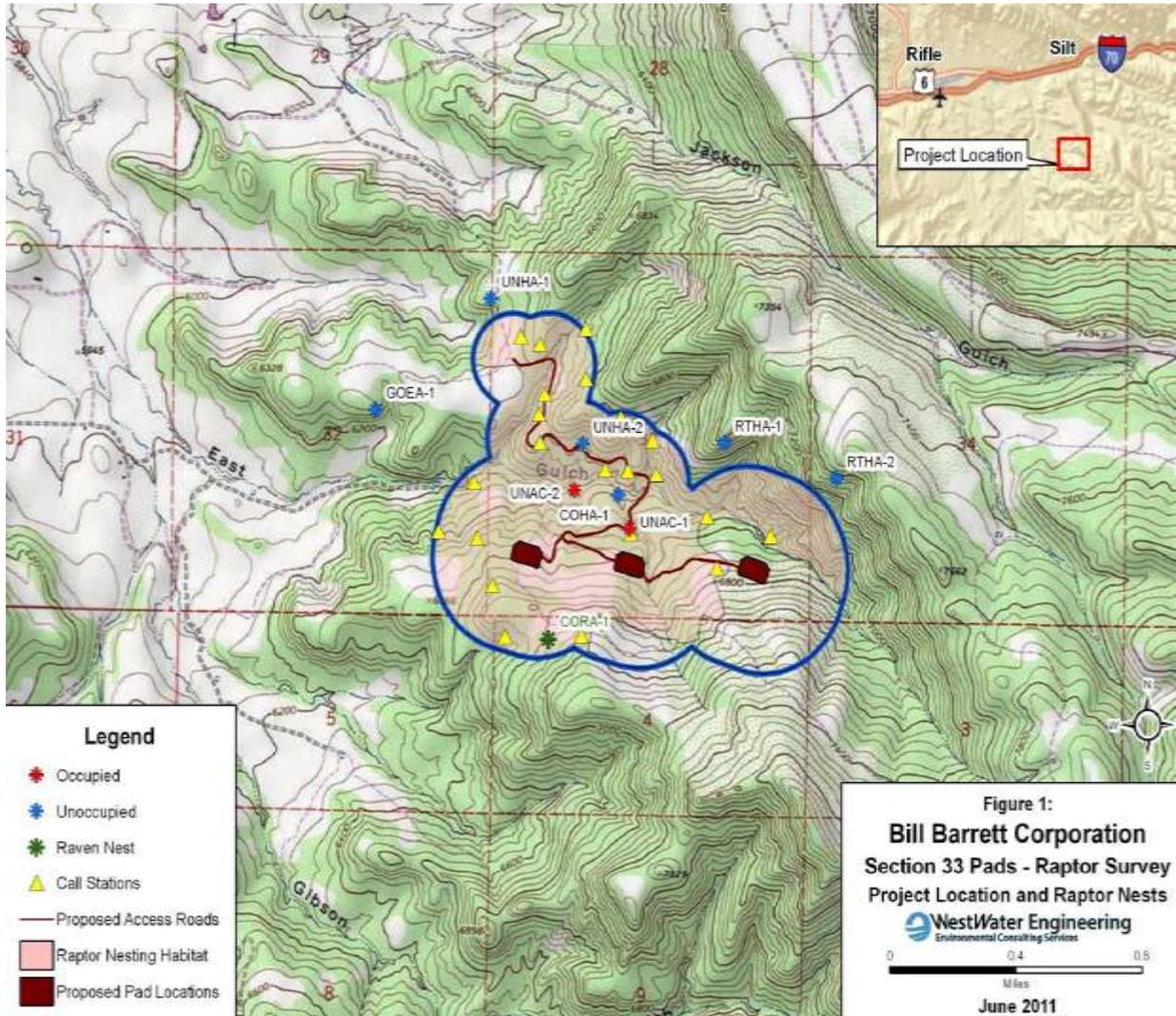


Figure 4. Results of 2011 Raptor Nest Surveys for the Section 33 pads (WWE 2011).

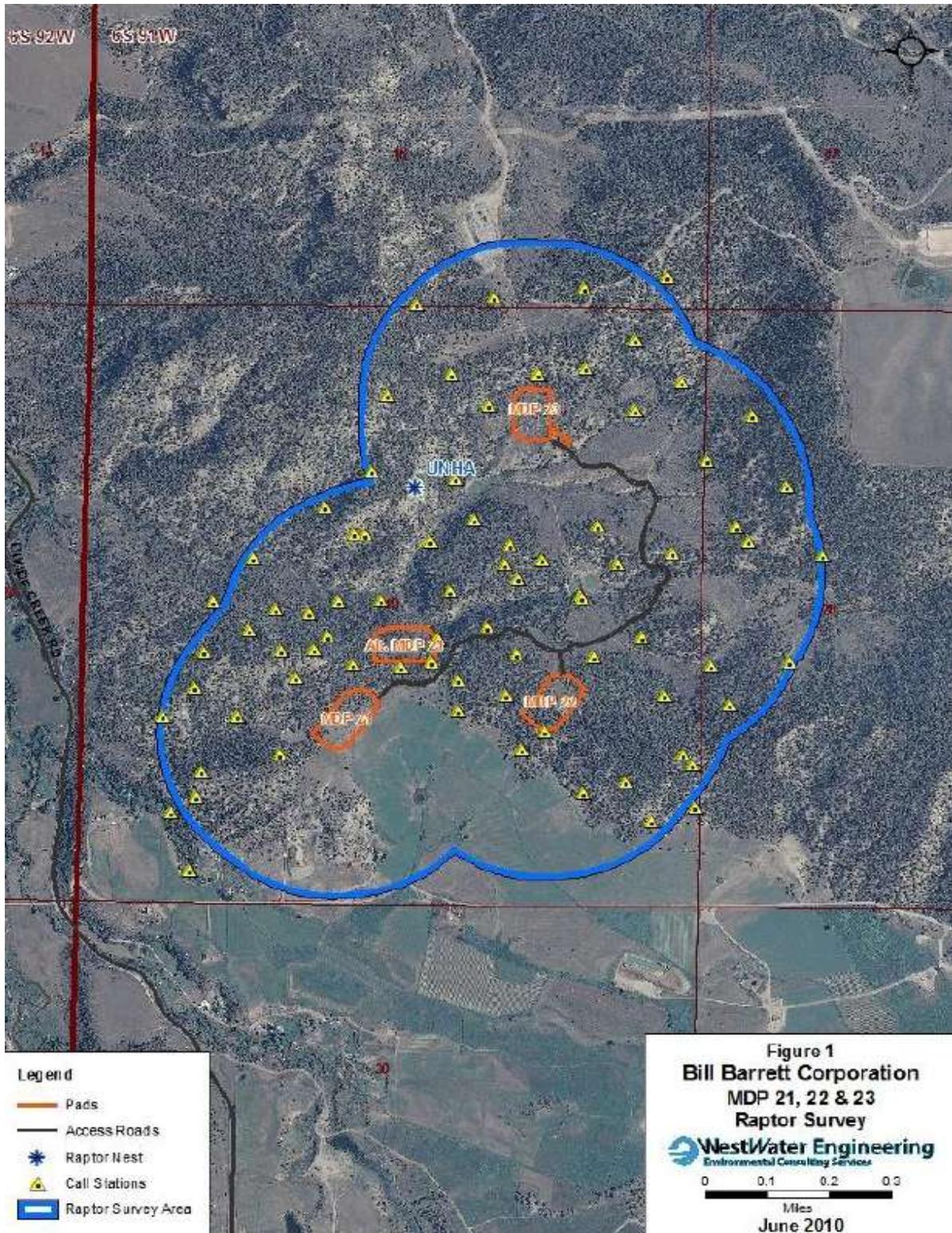


Figure 5. Results of 2011 Raptor Nest Surveys for the Section 19 pads (WWE 2011).

Environmental Consequences

Proposed Action

The Proposed Action would result in the removal of approximately 68 acres of vegetation due to pad, road, and pipeline construction. Some of the vegetation loss would be short-term until such time as interim reclamation is completed. Total long-term vegetation/habitat loss is estimated at 20 acres. Where larger pinyon and juniper trees are removed and replaced with grasses and forbs, the vegetation/habitat would not function as it does in its current capacity. This would result in a loss of cover, forage, breeding and nesting habitat.

The Proposed Action would further fragment habitat and reduce habitat patch size and connectivity in the area. Fragmentation could alter species composition and abundance. Species that require interior habitat could be displaced, while more common species that prefer openings or forest edges could benefit. In fragmented habitats, nest predation occurs more frequently near forest edges (Dobkin 1994). In addition, the most common avian and mammalian nest predators typically occur in higher densities around forest edges (Bider 1968). In the CRVFO area, these include the raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and black-billed magpie (*Pica hudsonia*) as well as feral cats (*Felis domesticus*). Fragmentation can also increase the risk of nest parasitism by brown-headed cowbirds (*Molothrus alter*), causing declines in local bird populations, including BCC species. These impacts, in conjunction with existing fragmentation and disturbance within and adjacent to the GGIMDP area, would reduce the value of the largely unfragmented interior habitat available to migratory birds.

Operation of heavy equipment would likely displace birds away from preferred habitats for a short time due to noise and human presence. Displaced individuals may fail to nest due to a lack of suitable habitat that is not already occupied and may also be subject to reduced survival if the areas into which they are displaced provide less food and cover. Research indicates that noise associated with development and production activities can also lead to lower avian diversity and density in both adjacent and distant areas (Forman 2000, Forman and Deblinger 2000). Noise can decrease usable habitat for birds by reducing the distance at which calls made by males are heard, affecting mate selection and reproductive potential.

Vegetation clearing conducted during the spring nesting season could result in the destruction of nests and/or eggs. Indirect take (e.g. failure due to abandonment of one or both adults) of nearby nests can also occur as a result of disturbance, although reactions vary among species. Some birds that are flushed from an area may appear relatively undisturbed, but their absence from the nest for a protracted period would leave eggs and nestlings vulnerable to overheating, chilling, predation, or (for the young) starvation.

The presence of fluid-containing pits could attract migratory birds for purposes of foraging or as a source of water. The extent and nature of the problem is not well defined can include drowning, loss of buoyancy or insulation from contact with chemicals, or direct toxicity from ingestion or absorption through the skin.

These impacts may result in a short-term decrease in the local populations of some species, particularly residents, although a loss of species viability within the overall range is not expected. Other species may be less susceptible to adverse impacts due to greater tolerance for human activity or more transitory use of the area. Nest sites that are in direct line-of-sight of construction activities have the most potential for being adversely affected. If there are vegetation or terrain features that tend to protect the nest, the effects of disturbance are often mitigated (WestWater 2011).

Federal lease COC50126, which underlies well pads MDP 21, 22, and 23 (Figure 5), includes a TL stipulation for raptor nesting. This stipulation prohibits surface use from April 2 through August 30 to

protect active raptor nesting areas. As a result of the raptor survey, a 60-day TL from April 1 through May 31 would also be applied as a COA to any activities authorized within 0.25 mile of these or other identified nests. A second TL would be applied to the same dates to prohibit removal of vegetation throughout the project area to reduce adverse impacts to other migratory birds, including the BCC species found to nest in the area. Appendix A provides details of this COA and describes potential bases for the granting of an exception to the TL.

The nest shown on Figure 4 as UNHA 4 is located approximately 25 feet from the centerline of the proposed access road to the three proposed Section 33 pads and would probably be removed upon implementation of the Proposed Action. The MBTA does not prohibit the removal of an unoccupied nest structure unless it is being actively tended by the adults during courtship or in preparation for nesting or being used as a roost by the adults or young following fledging. This lack of protection for inactive nests is based on the tendency for most raptors to build and use alternate nest sites within their home ranges and their behavioral plasticity when natural events such as windstorms or wildfires result in loss of nests. However, with regard to this nest and to project-related activities in proximity to any of the nests shown on Figures 4 and 5, or that may be built and used by raptors in future years, the operator remains subject to the MBTA, administered by the USFWS, which precludes the “take” of any raptor or most other native species. The MBTA prohibits the “take” of a protected species. Under the Act, the term “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The USFWS interprets “harm” and “kill” to include loss of eggs or nestlings due to abandonment or reduced attentiveness by one or both adults as a result of disturbance by human activity, as well as physical destruction of an occupied nest.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

3.8 Native American Religious Concerns

Affected Environment

The proposed GGIIMDP project is located within a larger area identified by the Ute Tribes as part of their ancestral homeland. Cultural resource inventories (see section on Cultural Resources) were conducted to determine if there were any areas that might be culturally sensitive to Native Americans. A small number of historic properties were identified during the inventories, though none are located in the areas of potential effect within proposed project area.

Environmental Consequences

Proposed Action

At present, no Native American concerns are known within the project area and none were identified during the inventories. The GGIIMDP is located within a larger area identified by the Ute Tribes as part of their ancestral homeland. Cultural resource inventories (see the section on Cultural Resources) were conducted to determine if there were any areas that might be culturally sensitive to Native Americans. No areas were identified during the inventories and none are currently known by the CRVFO within the GGIIMDP area. In addition, the Ute Tribe (of the Uintah and Ouray Bands), Southern Ute, and Ute Mountain Ute Tribes were notified of the proposed GGIIMDP on July 12, 2011. No responses, questions,

or requests for additional information have been received by August 15, 2011. If new data are disclosed, new terms and conditions may have to be negotiated to accommodate their concerns. Although the Proposed Action would have no direct impacts, increased access and personnel at the site could indirectly impact unknown Native American resources ranging from illegal collection to vandalism.

The NHPA requires that if newly discovered cultural resources are identified during project implementation, work in that area must stop and the agency Authorized Officer notified immediately (36 CFR 800.13). 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 agency 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)). Further actions also require compliance under the provisions of NHPA and the Archaeological Resource Protection Act. Bill Barrett Corporation will notify its staff and contractors of the requirement under the NHPA, that work must cease if cultural resources are found during project operations. A standard Education/Discovery COA for the protection of Native American values would be attached to the APDs (Appendix A). The importance of these COAs should be stressed to the operator and its contractors, including informing them of their responsibilities to protect and report any cultural resources encountered. The operator and its contractors would be made aware of the requirements under the NAGPRA.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

3.9 Noise

Affected Environment

Noise is generally described as unwanted sound, and noise intensity (or loudness) is measured as sound pressure in units of decibels (dBAs). The decibel scale is logarithmic, not linear, because the sound range that can be detected by a human ear is so great that it is convenient to compress the scale to encompass all the sounds that need to be measured. Each 20-unit increase in the decibel scale increases the sound loudness by a factor of 10. Sound levels were calculated for areas that exhibit typical land uses and population densities. In rural areas, ambient sound levels are expected to be approximately 30 to 40 dBA (EPA 1974, Harris 1991). For comparison, the noise level during normal conversation of two people 5 feet apart is 60 dBA.

The Proposed Action would lie within a rural setting approximately 3 miles south of I-70. The closest residence would be more approximately 1,000 feet from the proposed pads. Noise levels in the project area are presently created by ranching/farming operations, traffic serving the existing nearby well pads and ongoing drilling and completion activities.

Environmental Consequences

Proposed Action

The project would result in increased noise levels during the construction, drilling, and completion phases. Noise would be most noticeable along roads used to haul equipment and at the pad location.

Drilling activities are subject to noise abatement procedures as defined in the COGCC Rules and Regulations (Aesthetic & Noise Control Regulations). The 2006 revised COGCC noise control rules call for noise levels from oil and gas operations at any well site and/or gas facility to comply with maximum permissible levels (Table 7) at a distance of 350 feet. Noise level may periodically increase to 10 dbA above levels in Table 7 for no more than 15 minutes in 1 hour period. Operations involving pipeline or gas facility installation or maintenance, the use of a drilling rig, completion rig, workover rig, or stimulation is subject to the maximum permissible noise levels for industrial zones.

Table 7. Noise Standards for Light industrial, Residential/Agriculture/Rural		
<i>Zone</i>	<i>7:00 A.M. to 7:00 P.M</i>	<i>7:00 P.M. to 7:00 A.M</i>
Light Industrial	70 dBA	65 dBA
Residential/Agricultural/Rural	55 dBA	50 dBA

Short-term (7- to 14-day) increases in nearby noise levels would characterize road and well pad construction. Based on the Inverse Square Law of Noise Propagation (Harris 1991) and a typical noise level for construction sites of 65 dBA at 500 feet (Table 8), project-related noise levels would be approximately 59 dBA at a distance of 1,000 feet, approximating active commercial areas (EPA 1974). These increased noise levels would be in addition to levels of noise that are already above background levels due to current oil and gas developments in the area.

Table 8. Typical Noise Levels at Construction Sites and Access Roads			
<i>Equipment</i>	<i>Noise Level (dBA)</i>		
	<i>50 feet</i>	<i>500 feet</i>	<i>1,000 feet</i>
Air Compressor, Concrete Pump	82	62	56
Backhoe	85	65	59
Bulldozer	89	69	63
Crane	88	68	62
Front End Loader	83	83	57
Heavy Truck	88	68	62
Motor Grader	85	65	59
Road Scraper	87	67	61
Tractor, Vibrator/Roller	80	60	54
Sources: BLM (1999a), La Plata County (2002)			

Noise impacts from drilling and completion activities would last approximately 45 to 60 days at each well. Noise would occur continuously, 24 hours per day, during the drilling and completion period. Based on a measured noise level of 68 dB(A) at 500 feet, actions associated with drilling and completion would generate approximately 62 dB(A) at 1,000 feet. This level of noise approximates that associated with light industrial activities (EPA 1974). These increased noise levels would be in addition to levels of noise that are already above background levels due to current oil and gas developments in the area.

Traffic noise would also be elevated as a consequence of the Proposed Action. The greatest increase would be along access roads during the drilling and completion phases. Based on the La Plata County data presented in Table 8, approximately 68 dBA of noise (at 500 feet) would be created by each fuel and water truck that travels these roads. Less noise would be created by smaller trucks and passenger vehicles

such as pickup trucks and sport utility vehicles. Although the duration of increased noise from this source would be short, it would occur repeatedly during the drilling and completion phases.

Noise impacts would decrease during the production phase but would remain at background noise levels. During maintenance and well workover operations, noise levels would temporarily increase above those associated with well production. These increased noise levels would be in addition to levels of noise that are already above background levels due to current oil and gas developments in the area. Traffic noise levels would affect residences located along CR 311, as it provides primary access into the area.

No Action Alternative

Under this alternative, noise impacts related to drilling, completing, servicing, and producing the Federal wells would not occur. However, one Fee well would likely be drilled from a Fee location in the area. This would significantly reduce impacts from traffic and drilling noise, but not eliminate them entirely.

3.10 Prime or Unique Farmland

Affected Environment

Prime or unique farmland is land that has the best combination of physical characteristics for producing food, feed, forage, fiber, and oil seed crops and is also available for these. Unique farmland is land other than prime farmland that is used for the production of specific high value food and fiber crops.

The Natural Resources Conservation Service (NRCS) mapped farmlands for Garfield County, Colorado (NRCS 2008). The analysis of farmlands applied here includes the system of farmlands occurring in the Gibson Gulch plan area and a 0.5-mile buffer (here called the analysis area). No prime or unique farmland occurs within the GGIIMDP area or in the analysis area. Other lands designated “prime if they become irrigated” are located approximately 0.3 mile from the MDP 22 and MDP 23 pads (NRCS 2008).

In Colorado, all agricultural lands that are irrigated, regardless of other soil characteristics, are considered "Farmlands of Statewide Importance" (e.g., mountain hay meadows). These lands in the project area are not currently irrigated, and are being used primarily for grazing. Therefore, these lands are not of statewide importance.

Environmental Consequences

Proposed Action

The Proposed Action would have no impact on prime or unique farmland or farmlands of statewide importance. Although some lands in the analysis area are “prime if they become irrigated,” the Proposed Action is not expected to result in direct or indirect adverse impacts to these areas, as the nearest location is approximately 0.3 mile away from any proposed disturbance.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

3.11 Range Management

Affected Environment

The Gibson Gulch site would be partially in the following four Allotments: Scott (#08106), Jackson Gulch (#18046), Whitman (#08102), and Kamm Mesa (#08101). See Table 9 for allotment details.

Table 9. Grazing Allotments within the Gibson Gulch MDP Area									
<i>No.</i>	<i>Allotment Name</i>	<i>Acre</i>	<i>No. of Livestock</i>	<i>Livestock Type</i>	<i>Begin</i>	<i>End</i>	<i>Public Land %</i>	<i>AUM</i>	<i>Affected By GGIIMDP</i>
08106	Scott	978	103	Cattle	5/15	6/13	100	102	306 acres
18046	Jackson Gulch	1,837	150	Cattle	5/16	6/14	100	148	1,223 acres
08102	Whitman	845	60	Cattle	5/1	5/31	100	61	462 acres
08101	Kamm Mesa	3,163	1,230	Cattle	5/10	6/9	4	50	373 acres

Environmental Consequences

Proposed Action

Development of the proposed GGIIMDP would result in approximately 68 acres of total short-term surface disturbance including pads, roads, and pipelines within the allotment. This disturbance would last for approximately 3 years or until grasses and forbs seeded during interim reclamation became productive. Long-term loss, which would last 20 to 30 years, would then be reduced to approximately 20 acres total within the allotments.

In addition to the loss of forage, an increase in human activity related to development and maintenance of the developments would cause cattle to avoid certain areas of the allotments. However, livestock may also benefit from improved access. New roads and pipelines would open access to areas of the allotments that are difficult for livestock to access because of thick brush and/or steep slopes. Improvement in livestock distribution would improve forage utilization throughout the allotment.

It is not anticipated that the impacts from implementation of the Proposed Action would require adjustment of the stocking rate for livestock. The level of forage utilization would be monitored on the allotment and if necessary, adjustments in livestock use would be made to protect land health.

Range improvements (fences, gates, reservoirs, water lines, etc.) would be avoided during development of natural gas resources to the maximum extent possible. If range improvements are damaged during exploration and development, the operator would be responsible for repairing or replacing the damaged range improvements.

If a new or improved access road bisects an existing livestock fence, steel frame gate(s) or a cattleguard with associated bypass gate shall be installed across the roadway to control grazing livestock.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee

location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

3.12 Realty Authorizations

Affected Environment

The BLM anticipates issuing right-of-way (ROW) grants in conjunction with the GGIIMDP. These ROW grants are required for the crossing of any BLM land not overlying the Federal oil and gas lease where the well pad being accessed by the road or served by the pipeline is located. A total of 3.8 miles of new road and 2.8 miles of new pipelines would be constructed. Only a fraction of these lengths—expected to be less than 1 mile each of new access road and new pipeline—would require ROW grants from the BLM. The remainder would be approved as lease operations or located on private land. Terms and conditions of the grants would include a watershed and big game winter range TL that precludes construction, drilling, or completion traffic from December 1 through April 30 and raptor nesting TL from February 1 to August 15 within 0.25 mile of a nest. These dates are applied to discretionary actions such as ROW grants irrespective of stipulations attached to the leases underlying the BLM lands. The BLM may, for consistency within the GGIIMDP area, modify the ROW stipulation dates for watershed protection, big game winter range, and raptor nesting to correspond with dates applied to the individual well pads based on the associated lease. Stipulations associated with the ROWs are presented in Appendix A.

Environmental Consequences

Proposed Action

Under the Proposed Action, the ROW authorizations would be granted subject to appropriate terms and conditions. These authorizations would provide BBC legal access for the construction and development of the proposed pads, roads, and pipelines. Standard BLM reclamation requirements would apply.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

3.13 Recreation

Affected Environment

No BLM Special Recreation Management Areas (SRMAs) are located within or adjacent to the project area (BLM 1999b). The portion of the CRVFO area within which the proposed action would occur provides for dispersed recreation in rural to semi-primitive motorized settings on BLM lands. Recreation activities primarily consist of hunting, undeveloped camping, off-highway vehicle (OHV) riding, and sightseeing.

The project area is located within both private and BLM surface lands. Private landowners have seasonal hunting restrictions identified within their Surface Use Agreements (SUAs) with oil and gas operators, including BBC. Hunting is managed and licensed by CPW, which provides permits for both big and small game within the area. One commercial hunting outfitter—Majestic Outfitters (Cheryl Monger,

4786 County Road 312, New Castle, CO 81647)—holds a special recreation permit for guided hunting in an area that includes the GGIIMDP. Most of the area covered by this permit is located farther south between Divide Creek and Garfield Creek, and also the area east of Garfield Creek.

No developed recreational facilities such as campgrounds, picnic areas, or improved hiking/biking trails are present within the GGIIMDP area. Several unpaved two-track roads including county roads suitable for four-wheel drive and OHVs cross the GGIIMDP, but their use is limited primarily to hunters and hikers.

Oil and gas development activities modify the landscape and the quality of recreational settings to varying degrees. The Proposed Action (oil and gas development) is generally consistent with roaded natural (RN) settings, based on the BLM-administered lands affected and the Recreation Opportunity Spectrum (ROS) classification system. The RN physical and social recreation setting is typically characterized by a natural appearing environment with moderate evidence of the sights and sounds of man, where modification and use practices are evident, but harmonize with the natural environment (USDI 1982). The recreational setting character of the proposed project area remains generally natural and primitive.

Environmental Consequences

Proposed Action

The Proposed Action would temporarily result in increased vehicle traffic, noise, dust, and human activity during construction. These activities would decrease nominally throughout the operational life of the project. Well pad construction and drilling activities would likely displace wildlife in localized areas adjacent to these activities. Recreation activities, such as hunting would be displaced to other locations within or adjacent to the project area, except where SUAs call for no drilling activities during certain hunting seasons.

Over the 20- to 30-year operating life of the project, the presence of oil and gas production facilities (wells, tanks, and pipelines) and operations and maintenance traffic would alter the recreational character of the project area but not enough to lose the general natural setting of the area. The recreation setting of the project area can be expected to remain within the RN category.

The use of multi-well production pads limits the extent of surface disturbance within a given area, which allows the RN settings to be retained after the project area has been developed. Both short term (construction) and long term (operations) would cause changes in the physical and social recreation setting impacting the recreation experience of traditional users,. During the short term, hunters and other recreationists would be temporarily displaced but would be able to shift their activities to surrounding public lands. Long-term impacts could potentially increase access to public lands from the newly constructed access roads and pipeline ROWs supporting the proposed project. It is recommended that BMPs (fencing and other movable barriers) be installed to limit access to previous inaccessible public lands. Without such BMPs, traditional recreational users such as hunters would be replaced by recreational users seeking different activity opportunities and experiences (e.g., OHV riders). However, recreation activities of the new users would not be outside the RN experience and activity opportunity characters. The Proposed Action is unlikely to increase public recreational access to and through the project area. Also, recreational activities would likely continue on adjacent lands by existing users.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee

location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

3.14 Socioeconomics

Affected Environment

The GGIIMDP project area is located entirely within Garfield County, Colorado. The total county land area is 2,947 square miles (City Data 2011). The county seat is in Glenwood Springs; other towns include Carbondale, New Castle, Silt, Rifle, Parachute, and Battlement Mesa. Highway I-70 transects the county from east to west. A network of county and private roads services the project area.

The population of the county grew by an average of approximately 3% per year from 2000 to 2010, resulting in a total increase of more than 27% from 44,259 to 56,298 residents (USD OC 2011). Population growth in Garfield County is expected to more than double over the ensuing 20 years to 119,979 in 2030 (DOLA 2010). Currently the population density is 10 people per square mile, which is low compared to the U.S. average. The county population in July 2009 was approximately 70% urban and 30% rural (City Data 2011). In 2009, Garfield County had an estimated 32,692 jobs. Industry groups with the highest percentage of total employment were construction (15%), tourism (14%), retail trade (13%), and education and health (8%) (Table 10).

Employment in agriculture, forestry, hunting, and mining accounted for 8% of the total employment. Jobs in the oil and gas extraction industry numbered 531 (Colorado Department of Labor and Employment 2010). This number, representing 1.6% of total jobs, is considered misleading because some oil and gas employment has been incorporated as part of the construction sector statistics instead (BLM 2006). For example, in the year 2005, an estimated 4,000 persons were directly employed by gas development companies and their subcontractors in Garfield County. The number of natural gas related jobs is projected to peak at 5,278 in 2017(Garfield County 2007).

Table 10. Selected Job Sectors for Garfield County

<i>Job Sector</i>	<i>No. of Jobs</i>	<i>Percent of Total</i>
Agriculture	644	2.0
Mining	1,956	6.0
Oil and Gas Extraction	531	1.6
Construction	5,029	15.4
Retail Trade (retail & wholesale)	4,444	13.6
Tourism	4,692	14.3
Education and Health	2,797	8.5
Government	5,035	15.4

Personal income in Garfield County has also risen, growing approximately 6% per year from \$1.3 billion in 2000 to \$2.1 billion in 2009. Annual per capita income has grown in the same period approximately 3% per year, from \$29,080 to \$37,099 (USD OC 2011). The communities of Parachute, Silt, and Rifle are considered to have the most affordable housing, while the communities of Battlement Mesa, New Castle, and Glenwood Springs are considered to have the least affordable housing, where the cost to rent or own similar housing may be 50% or more higher (BLM 2006).

In 2009, industry groups in Garfield County with the highest percentage of total employment were Construction 15%, Tourism 12%, Retail Trade 13%, and Education and Health 20% (Colorado Department of Labor and Employment 2010). An estimated 13.3% of the population was retired in the year 2000 and did not earn wages (Garfield County 2000). Employment in agriculture, forestry, hunting, and mining accounted for 8% of total employment (Colorado Department of Labor and Employment 2010).

Activities on public land in the vicinity of the project area are primarily ranching/farming, hunting, OHV travel, and the development of oil and gas resources. Hunters contribute to the economy because many require lodging, restaurants, sporting goods, guides and outfitting services, food, fuel, and other associated supplies. Big-game hunting, in particular, is viewed as critical to Garfield County, and especially the local community economies that depend on BLM and Forest Service public lands where most hunting occurs (BLM 2006). Expenditures by hunters in the Roan Plateau Planning Area alone have been estimated to be as much as \$1 million annually, with perhaps an additional \$1 million annually of indirect and local expenditures (CPW 1995, cited in BLM 2006).

The growth of the oil and gas industry in the past 10 years has been increasingly important to local economies (BLM 2006). Production of natural gas in Garfield County increased dramatically during recent years, from approximately 70 billion cubic feet (BCF) in 2000 to 576 BCF in 2009 (COGCC 2010). In addition, Garfield County is experiencing the fastest increase in oil and gas development in Colorado, with over 2,000 drilling permits currently approved between July 2009 and September 2010 (COGCC 2010). While the number of workers employed in the mining and extraction industry in Garfield County has been shown to be only 1.7%, this number is considered misleading because some oil and gas employment has been incorporated as part of the construction sector statistics instead (BLM 2006). For example, in the year 2005, an estimated 4,000 persons were directly employed by gas development companies and their subcontractors in Garfield County (Garfield County 2009).

The predominant revenue source for Garfield County is property tax, which makes up approximately half of the County's total revenue. Growth in this revenue source is primarily driven by the oil and gas industry (Garfield County 2011a). Property tax revenue from oil and gas development has become the largest source of public revenue in Garfield County (BLM 2006) and is the primary revenue source for the General Fund, Capital Expenditures Fund, Road and Bridge Fund, Retirement fund, and Human Services Fund. Together these funds comprise 77% of the budget. In the year 2009, oil and gas assessed valuation in the County amounted to approximately \$3.8 billion, or about 74% of the total assessed value (Garfield County 2011b). In 2010, the oil and gas assessed valuation amounted to \$2.0 billion, or about 60% of the total assessed value, reflecting the effects of low natural gas prices and the economic downturn on exploration and production. However, total tax revenues increased from \$135 million in 2009 to \$153 million in 2010. Tax dollar distributions in 2010 were Schools 34.6%, County 30.4%, Special Districts 12.3%, Fire Districts 12.0%, Colleges 8.2%, and Towns 2.5%.

The Federal government makes Payments in Lieu of Taxes (PILT) to County governments to help offset property tax revenue lost on non-taxable Federal lands located within County boundaries (BLM 2006). The PILT distributions are based on acres for all Federal land management agencies (e.g., approximately 1.9 million acres in Garfield County). The amount may also be adjusted based on population and as apportioned by Congress. By formula, payments are decreased as other Federal funds, such as mineral royalty payments, increase. PILT amounts to Garfield County in the last 5 years are shown in Table 11.

In addition to PILT distributions, BLM shares revenue generated by commercial activities on public lands with State and County governments. Federal mineral royalties (FMLs) are collected on oil and gas production from Federal mineral leases. Oil and gas lessees pay royalties equal to 12.5% of the well head value of oil and gas produced from public lands. Half of the royalty receipts are distributed to Colorado.

In 2008 and 2009 Garfield County received FML and Severance Direct Distribution Payments totaling \$2,744,802 and \$11,400,046 respectively (AGNC 2011). These funds are then allocated to fund County services, schools, and local communities.

<i>Year</i>	<i>PILT Amounts</i>
2011	\$391,032
2010	\$391,649
2009	\$1,808,984
2008	\$654,453
2007	\$1,078,087

The NEPA process requires a review of the environmental justice issues as established by Executive Order 12898 (February 11, 1994). The order established that each Federal agency identify any “disproportionately high and adverse human health or environment effects of its programs, policies, and activities on minority and low-income populations.” The Latino community is the only minority population of note in the vicinity of the project area. In 2010, 28.3% of the residents of Garfield County identified themselves as Hispanic or Latino, and this is slightly higher than for Colorado (20.7%). African Americans, American Indians, and Pacific Islanders account for less than 2% of the Garfield County population, which are below state levels (DOLA 2010).

Environmental Consequences

Proposed Action

The Proposed Action would positively impact the local economies of Garfield County through creation or retention of job opportunities in the oil and gas industry and in supporting trades and services. In addition, local governments in Garfield County would experience an increase in tax and royalty revenues. Some minor economic loss to private landowners or guides may result from potential displacement of big game and resulting reduction in big game hunting within the project area. The Proposed Action could also result in minor negative social impacts, including a decrease in the recreational character of the area, reduced scenic quality, increased dust levels, and increased traffic. However, most of these impacts would be minor and limited to the relatively short duration of drilling and completion activities.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

3.15 Soils (includes an analysis on Public Land Health Standard 1)

Affected Environment

Soils within the GGIIMDP area consist of several types of surficial materials (Soule and Stover 1985):

- residual material produced by in-situ weathering of underlying bedrock, which is primarily shale
- colluvium and mass wasting deposits including landslides, debris flows, and slumps

- aeolian (wind) deposits of sand and silt
- alluvial deposits including alluvial fan gravels and floodplain alluvium in stream valleys

Lack of moisture associated with the semi-arid climate has suppressed vegetation growth and slowed the chemical and biological processes commonly associated with soil development (BLM 1994). In addition, soil fertility is hampered by high salinity and susceptibility to wind and water erosion. Soils in the project area support low-density livestock grazing and wildlife habitat, but generally have a poor revegetation potential due to these limiting factors. However, soils in alluvial valleys and some gently sloping mesa summits are capable of supporting irrigated and dryland crops, principally hay and alfalfa.

The GGIIMDP is located along the upper reaches and ephemeral drainages of the Divide Creek at elevations between 5,500 and 7,000 feet elevation. Soils of the proposed project area are included in the *Soil Survey of Rifle Area, Colorado* (NRCS 2008, USDA 1985). According to this survey, the project area contains five soil types. Table 12 lists the soil mapping units within the GGIIMDP area and indicates environmental and construction-related constraints associated with each soil type.

Table 12. Project Area Soils				
<i>Mapping Unit Name and Number; Percent Slope</i>	<i>Description</i>	<i>Erosion Hazard</i>	<i>Suitability</i>	<i>Proposed Construction Type</i>
Bucklon-Inchau Loams 25-50%	Well-drained soils on ridges and mountainsides from 7,000 to 9,500 feet. Surface layer is loam 3 to 5 inches thick; upper subsoil, where present, is brown clay loam about 15 inches thick. This soil has slow to moderate permeability and is generally used for irrigated pasture, hay, and grazing.	Severe	VII: Very severe construction limitations due to erosion and slope	MDP 26
Morvall-Tridell Complex 6 – 25%	Deep, well-drained soils on alluvial fans and mesa sides from 6,500 to 8,000 feet. Surface layer is loam or stony loam up to 10 inches thick; upper subsoil is clay loam to very stony loam about 12 inches thick. This soil has moderate permeability and is mainly used for grazing.	Moderate	VIe: Moderate to severe construction limitations due to erosion	MDP 24 and 25, Access Roads,
Potts-Ildefonso Complex 12-25%	Deep well drained hilly sloping soils are on mesas, alluvial fans and valley sides from 5,000 to 6,500 feet. The Potts soil is formed in sandstone, shale, or basalt. The Ildefonso soil is formed in calcareous, basaltic alluvium and aeolian material. This soil has moderate permeability and uses are mainly grazing and wildlife habitat.	Moderate	VIe: moderate to severe construction limitations due to erosion	MDP 22 and 23
Torriorthents-Camborthids-Rock Outcrop Complex 15-70%	Exposed sandstone and shale bedrock, loose stones, stony basaltic alluvium and shallow to deep soils formed on foothills and mountainsides. This soil complex is generally used for grazing, wildlife habitat, and recreation. This soil has moderate permeability and is unsuitable for crops.	Moderate to Severe	VIIe: Very severe construction limitations due to erosion and slope	Access Roads
Torriorthents- - Rock Outcrop Complex 15-70%	Exposed sandstone and shale bedrock and stony basaltic alluvium. The Torriorthents are on foothills and mountainsides below rock outcrop. This complex has moderate permeability and is used for grazing, wildlife habitat, and recreation.	Moderate to Severe	VIIe: Very severe construction limitations due to rock outcrops, steep slopes and stoniness	MDP 21 and 22, Access Roads and pipeline

Soils with a severe or very severe water erosion hazard tend to be found on moderately to steeply sloping lands. These soils also tend to be relatively impermeable, meaning that more precipitation tends to run

off the surface rather than infiltrate into the soil. Other important soil characteristics that make a soil highly erodible by water include high contents of silt and very fine sand; expansive types of clay; a tendency to form surface crusts; the presence of impervious soil layers; and blocky, platy, or massive soil structure (Brady and Weil 2002).

Soils with slow to very slow permeability are susceptible to ponding of water at the surface. A low available water capacity can be an impediment to revegetation. Soils within the GGIIMDP area are not subject to flooding or high water tables.

While unlikely to occur in the GGIIMDP area, trenching for pipeline or road construction on mesa tops and in areas where soils average less than 60 inches to bedrock may encounter bedrock or boulders that require blasting.

Environmental Consequences

Proposed Action

The Proposed Action would involve surface disturbance for access roads, six well pads and pipelines, and would result in approximately 68 acres of short-term vegetation loss and soil compaction and displacement, with a long-term loss of approximately 20 acres. In general, the area that would be affected by the Proposed Action contains adequate vegetation buffers and moderate slopes that would reduce the potential for sediment transport to Divide Creek and the Colorado River. The GGIIMDP area includes a few areas on the access roads and MDP 26 which are susceptible to erosion such as erosive soils and steep slopes. In areas susceptible to erosion or slope instability issues, construction techniques (retaining structures, full bench cut, no side-casting, etc.), proper erosion control, and geotechnical analysis and design may be required. Engineered design for construction oversight in areas of slope instability and severe erosion would be required. No soils that are subject to flooding or high water tables would be affected by the proposed project.

In addition, construction activities would cause mixing of soil horizons, slight to moderate increases in local soil loss, loss of soil productivity, and sediment available for transport to surface waters. Noxious weed infestation resulting from disturbance would impact soil productivity. Potential for such soil loss and transport would increase as a function of slope, feature (pad, road, or pipeline route) to be constructed, and proximity to streams.

Throughout the affected area, the potential would also exist for accidental spills or leaks of petroleum products and hazardous materials during construction, drilling activities and long term operations for the life of the wells. These events would cause soil contamination and may decrease the soil fertility and revegetation potential.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

Analysis on Public Land Health Standard 1 for Upland Soils

A formal Land Health Assessment (LHA) was completed in 2009 in the area of the Proposed Action and published as the "Divide Creek Land Health Assessment" in 2010 (BLM 2009). Standard 1 for Upland

Soils is currently being met at all sites. With successful road and pad design, topsoil handling procedures, erosion control methods, and restoration measures during construction and restoration activities, the Proposed Action would not prevent the area from meeting Standard 1.

3.16 Special Status Species (includes an analysis on Public Land Health Standard 4)

Federally Listed, Proposed, or Candidate Plant Species

Affected Environment

According to the latest species list from the USFWS, the following Federally listed, proposed, or candidate plant species may occur within or be impacted by actions occurring in Garfield County: Parachute beardtongue (*Penstemon debilis*), DeBeque phacelia (*Phacelia submutica*), Colorado hookless cactus (*Sclerocactus glaucus*), and Ute ladies'-tresses orchid (*Spiranthes diluvialis*).

Environmental Consequences

Proposed Action

Results of plant surveys conducted in October 2010 indicated no habitat for Federally listed, proposed, or candidate plant species in the project area. Therefore, the project would have “**No Effect**” on these species.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

Federally Listed, Proposed, or Candidate Animal Species

Affected Environment

Eight species of Federally listed, proposed, or candidate threatened or endangered vertebrate species occur within Garfield County or may be affected by projects within the County. These species, their status, and their distributions and habitat associations in the region are summarized below:

Canada Lynx (*Lynx canadensis*). Federally listed as threatened. Canada lynx occupy high-latitude or high-elevation coniferous forests characterized by cold, snowy winters and an adequate prey base (Ruggiero et al. 1999). The preferred prey of Canada lynx throughout their range is the snowshoe hare (*Lepus americanus*). In the western United States, lynx are associated with mesic forests of lodgepole pine, subalpine fir, Engelmann spruce, and quaking aspen in the upper montane and subalpine zones, generally between 8,000 and 12,000 feet in elevation. Although snowshoe hares are the preferred prey in Colorado, lynx also feed on other species such as the mountain cottontail (*Sylvilagus nuttallii*), pine squirrel (*Tamiasciurus hudsonicus*), and dusky grouse (*Dendragapus obscurus*).

The USFS has mapped suitable denning, winter, and other habitat for lynx within the White River National Forest (WRNF), portions of which are adjacent to BLM lands within the CRVFO. The mapped suitable habitat in the WRNF comprises several areas known as Lynx Analysis Units (LAUs). Several LAUs border BLM lands along the I-70 corridor from east of Wolcott to west of DeBeque. While BLM

lands within the CRVFO area are generally not suitable habitat, they may support movement by animals dispersing to a new area or, potentially, moving to lower elevations during severe winter weather in search of prey. The project area does not border the Battlement Creek LAU and therefore will not be considered further in this document.

Mexican Spotted Owl (*Strix occidentalis*). Federally listed as threatened. This large owl nests, roosts, and hunts in mature coniferous forests in canyons and foothills. The only extant populations in Colorado are in the Pikes Peak and Wet Mountain areas of south-central Colorado and the Mesa Verde area of southwestern Colorado. Because no known occurrences or suitable habitats are present in the project vicinity, this species is not considered further.

Razorback Sucker (*Xyrauchen texanus*), Colorado Pikeminnow (*Ptychocheilus lucius*), Humpback Chub (*Gila cypha*), and Bonytail (*G. elegans*). Federally listed as endangered. These four species of Federally listed big-river fishes occur within the Colorado River drainage basin near or downstream from the project area. Designated critical habitat for the razorback sucker and Colorado pikeminnow includes the Colorado River and its 100-year floodplain west (downstream) from the town of Rifle. The nearest known habitat for the humpback chub and bonytail is within the Colorado River approximately 85 miles downstream from the project area. Occasionally, the bonytail is found in Colorado west of Grand Junction, but its range does not extend east from that point. Only one population of humpback chub, at Black Rocks west of Grand Junction, is known to exist in Colorado.

Greenback Cutthroat Trout (*Oncorhynchus clarki stomias*). Federally listed as threatened. The greenback cutthroat trout was not identified on the USFWS list for Garfield County; however, recent surveys have identified a population in Cache Creek, located several drainages west of the project area. The greenback is the subspecies of cutthroat trout native to the Platte River drainage on the Eastern Slope of Colorado, while the Colorado River cutthroat trout (*O. c. pleuriticus*) is the subspecies native to Garfield County and throughout the Western Slope of Colorado. Although the occurrence of greenbacks in Cache Creek and potentially elsewhere in the CRVFO and WRNF areas is apparently the result of human intervention (e.g., sanctioned or *ad hoc* transplantation of fish from the Eastern Slope), its status as threatened applies to Western Slope populations. However, because drainages within the project area do not support this species, it is not considered further.

Environmental Consequences

Proposed Action

The Canada lynx, Mexican spotted owl, and western yellow-billed cuckoo are not expected to occur in the project vicinity based on habitat types present and documented occurrences. Therefore, the Proposed Action would have “**No Effect**” on these species.

For the four Federally listed big-river fishes, BLM prepared a Programmatic Biological Assessment (PBA) in 2008 addressing water-depleting activities associated with the BLM fluid minerals program in the Colorado River Basin in Colorado. In response to this PBA, the USFWS issued a Programmatic Biological Opinion (PBO) (ES/GJ-6-CO-08-F-0006) on December 19, 2008. The PBO concurred with BLM’s effects determination of “**May Affect, Likely to Adversely Affect**” the Colorado pikeminnow, bonytail, humpback chub, or razorback sucker as a result of depletions associated with oil and gas projects. To offset the impacts, the BLM has set up a Recovery Agreement, which includes a one-time fee per well for site-specific mitigation projects. These funds are used to contribute to the recovery of endangered fish through the restoration of habitat, propagation, and genetics management, instream flow identification and protection, program management, non-native fish management, research and monitoring, and public education.

Other potential impacts to these species include inflow of sediments from areas of surface disturbance and inflow of chemical pollutants related to oil and gas activities on the well pads, associated with ancillary surface facilities, or resulting from an accident involving a haul truck in proximity to a stream. Stormwater controls required for the protection of surface water quality would also provide protection of aquatic organisms (see COAs in Appendix A). Even if sediment inflow were to occur, including incidental aerial deposition of fugitive dust from roadways and construction areas, these fishes are adapted to the naturally high sediment loads that characterize the Colorado River and its tributaries.

The inflow of chemical pollutants could impact the endangered big-river fishes if concentrations were sufficient to cause acute effects. The potential for adverse impacts would be limited to the Colorado pikeminnow and razorback sucker, the two species known to occur within the CRVFO area. Spills or other releases of chemical pollutants as a result of oil and gas activities are infrequent in the CRVFO area due to the various design requirements imposed by BLM and the State of Colorado. In the event of a spill or accidental release, the operator is required to implement its Spill Prevention, Control, and Countermeasures (SPCC) plan, including such cleanup and mitigation measures as required by BLM or the State. In addition, stormwater controls (Appendix A) would reduce the risk of transport of these substances as well as sediments to surface waters, including the Colorado River. For these reasons, and because any spills making their way into the Colorado River would be rapidly diluted to levels below that are not deleterious, or even detectable, the potential for adverse impacts from chemical releases is not considered significant. Consequently, the Proposed Action would have “**No Effect**” on the endangered big-river fishes from potential impacts to water quality.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

BLM Sensitive Plant Species

Affected Environment

BLM sensitive plant species with habitat and/or occurrence records in Garfield County include DeBeque milkvetch (*Astragalus debequaeus*), Naturita milkvetch (*Astragalus naturitensis*), Piceance bladderpod (*Lesquerella parviflora*), Roan Cliffs blazing star (*Mentzelia rhizomata*), Harrington’s penstemon (*Penstemon harringtonii*), and Cathedral Bluffs meadow-rue (*Thalictrum heliophilum*).

Environmental Consequences

Proposed Action

Results of an October 2010 plant inventory indicate no BLM sensitive plant species or their habitats in the vicinity of the project.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. Although one Fee well would likely still be drilled from a Fee location in the area, no BLM sensitive plant species occur in the project area. Consequently, these species would not be affected by this alternative.

BLM Sensitive Animal SpeciesAffected Environment

BLM sensitive animal species with habitat and/or occurrence records in the portion of the CRVFO that includes the project area are listed in Table 13. Species known to occur or considered possible or likely to occur are discussed in more detail following the table.

Table 13. Special Status Wildlife Species Present or Potentially Present in the Project Area		
<i>Common Name</i>	<i>Habitat</i>	<i>Potential for Occurrence</i>
Fringed myotis, Townsend's big-eared bat	Breed and roost in caves, trees, mines, and buildings; hunt over pinyon-juniper, montane conifers, and semi-desert shrubs.	Possible
Northern goshawk	Primarily nests in spruce/fir forests but also use Douglas-fir, various pines, and aspens but may move to lower elevation forests in winter.	Possible
Bald eagle	Nests and roosts in mature cottonwood forests along rivers, large streams, and lakes.	No suitable habitat
Brewer's sparrow	Nests almost exclusively in sagebrush shrublands, typically in extensive stands of Wyoming big sagebrush on level or gently rolling terrain.	Possible
Midget faded rattlesnake	Limited to cold desert dominated by sagebrush and with an abundance of rock outcrops and exposed canyon walls, typically farther west in the CRVFO.	No suitable habitat
Great Basin spadefoot	Breeds in seasonal pools and slow-moving streams in pinyon-juniper woodlands and semi-desert shrublands, typically farther west than the CRVFO.	No suitable habitat
Northern leopard frog	Wet meadows and the shallows of marshes, glacial kettles, beaver ponds, lakes, reservoirs, streams, and irrigation ditches.	Possible
Colorado River cutthroat trout	Restricted to small headwaters streams isolated from introductions or colonization by non-native trouts.	Not found during fish surveys
Flannelmouth sucker and roundtail chub	Generally restricted to rivers and major tributaries. No habitat for these species within the project vicinity.	Present in Colorado River and Divide Creek
Bluehead sucker	Found in smaller streams with rock substrate and mid to fast flowing water.	Present in Divide Creek

Environmental Consequences*Proposed Action*

For the sensitive species listed in Table 13, the minor amount of direct or indirect loss of suitable habitat, the transient nature of their potential use of the area, and the brief period of construction-related activities in any given part of the project area combine to result in negligible potential for adverse impacts. The bases for this determination are summarized below.

Fringed Myotis (*Myotis thysanodes* and Townsend's Big-eared Bat (*Corynorhinus townsendii*) – No caves or other suitable roosting sites occur in the project area. Loss of large trees, potentially also used for roosting, would be negligible. No new loss of habitat above which the bats could search for aerial prey would occur, and the area they might avoid during nighttime drilling and completion activities would represent a small portion of their total feeding range, if present.

Northern Goshawk (*Accipiter gentilis*) – This species is mostly limited to spruce/fir or aspen forests, such as atop the Roan Plateau, Battlement Mesa, and other areas that reach subalpine elevations. However, goshawks may migrate to lower elevation pinyon-juniper or Douglas-fir habitats during winter and

therefore could make occasional, transitory use of the project area for winter foraging. Goshawks feed primarily on small birds but also on diurnal small mammals (rabbits, chipmunks, etc.).

Brewer's Sparrow (*Spizella breweri*) – This project vicinity contains limited and marginal habitat for the Brewer's sparrow, which generally is restricted to extensive, uniform stands of sagebrush, primarily sagebrush steppe. If the species were to occur, oil and gas activities occurring within the home range of a nesting pair could cause individuals to shift their feeding patterns and to locate their nests to avoid the disturbance (noise, dust, human activity). However, this impact would be limited to the nesting season and would not be an issue for long-term production and maintenance operations.

Northern Leopard Frog (*Rana pipiens*) – The northern leopard frog is limited to perennial waters, including ponds and slow-flowing perennial streams or persistent portions of intermittent streams. It requires good water quality and abundant aquatic or shoreline vegetation. Suitable habitat occurs along some streams in the general vicinity of the project. However, because the project would not involve habitat disturbance near water sources, impacts to this species are not expected.

Flannelmouth Sucker (*Catostomus latipinnis*) and Roundtail Chub (*Gila robusta*) – As with the ecologically similar Colorado River endangered fishes described above, the flannelmouth sucker and roundtail chub are adapted to naturally high sediment loads and therefore would not be affected by increased sediment transport to the Colorado River or Divide Creek, in the unlikely event that this were to occur as a result of the project. Protective COAs for water quality would minimize this potential (Appendix A). These species are vulnerable to alterations in flow regimes in the Colorado River (including evaporative losses from dams and depletions from withdrawal of water for irrigation or municipal water supplies) that affect the presence of sandbars and seasonally flooded overbank areas needed for reproduction. The small amount of water consumption associated with the Proposed Action would not cause discernible impacts to the Colorado River flow regime.

Bluehead Sucker (*Catostomus discobolus*) – This species is found throughout the middle and upper Colorado River Basin, in a variety of areas from headwater streams to large rivers (Woodling 1985). Known occurrences in the vicinity include Divide Creek which is located between 0.1 and 2.0 miles west of the GGIIMDP boundary. The potential increase of sedimentation into the Divide Creek would likely be nominal given background sediment loads currently carried by the creek. Sediment-intolerant aquatic wildlife could be negatively affected, as increased erosion potential would persist and impair water and habitat quality. Measures to minimize erosion and sedimentation of aquatic environments are included among the COAs (Appendix A). The small amount of water consumption associated with the Proposed Action would not cause discernible impacts to the Divide Creek flow regime.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

Analysis on Public Land Health Standard 4 for Special Status Species

According to the Divide Creek LHA (BLM 2009), qualitative information suggests all sites with potential special status species habitat were found to be in good condition, providing healthy and productive habitat. Based on the overall condition of upland and riparian habitats located on public lands, suitable habitat is available for BLM sensitive plant and terrestrial wildlife species within the Divide Creek LHA. Thus, Standard 4 for BLM sensitive terrestrial wildlife species is being met within the Divide Creek

watershed. However, the habitat alteration associated with the Proposed Action would likely contribute to a declining trend and reduce the potential for meeting or maintaining Standard 4 for special status species over the long term. With the implementation of the mitigation measures identified in this section and elsewhere in the EA, Standard 4 for special status species and their habitats would be achieved, but populations could be at risk with increasing natural gas development.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

3.17 Vegetation (includes an analysis on Public Land Health Standard 3)

Affected Environment

The primary vegetation types in the GGIIMDP include Gambel's oak (*Quercus gambelii*), mixed mountain shrublands, pinyon-juniper (*Pinus edulis*-*Juniperus osteosperma*) woodlands, and Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) shrublands. In general, the southern portion of the GGIIMDP contains habitat in good condition with few invasive non-native species. Habitat in the northern portion of the project area is somewhat degraded, with prolific cheatgrass.

Gambel's Oak and Mixed Montane Shrublands – This vegetation type is typically dominated by Gambel's oak alone or codominant with serviceberry (*Amelanchier alnifolia*), mountain-mahogany (*Cercocarpus montanus*), chokecherry (*Padus virginiana*), snowberry (*Symphoricarpos rotundifolius*), and mountain big sagebrush (*Artemisia tridentata* ssp. *pauciflora*). Native forbs are generally common beneath the shrubs or in small clearings. Typical species include tailcup lupine (*Lupinus caudatus*), Osterhout's penstemon (*Penstemon osterhoutii*), aspen daisy (*Erigeron speciosus*), running fleabane (*Erigeron flagellaris*), Drummond's rockcress (*Boechera drummondii*), Nuttall's larkspur (*Delphinium nuttallianum*), small-leaf pussytoes (*Antennaria parviflora*), lambs-tongue groundsel (*Packera integerrimus*), longleaf phlox (*Phlox longifolia*), sticky false starwort (*Pseudostellaria jamesii*), and narrowleaf mountain trumpet (*Collomia linearis*). Elk sedge (*Carex geyeri*), a native perennial graminoid, is also common, as are various native perennial grasses.

Pinyon-Juniper Woodland – Pinyon-juniper woodlands in the project area contain varying densities of pinyon pine. In Section 19, Utah juniper is found much more frequently than pinyon pine; however, in Section 33 pinyon pine is found just as frequently as juniper. Other species found in the understory are Wyoming big sagebrush, and less commonly mountain mahogany, bitterbrush (*Purshia tridentata*) and snakeweed (*Gutierrezia sarothrae*). In general, the sparse herbaceous layer consists of graminoids such as cheatgrass, bluebunch wheatgrass (*Pseudoroegneria spicata*), Indian ricegrass (*Achnatherum hymenoides*), and squirreltail (*Elymus elymoides*). Forbs are a minor component.

Wyoming Big Sagebrush Shrubland – These shrublands are dominated by Wyoming big sagebrush. Scattered juniper, fourwing saltbush (*Atriplex canescens*), rubber rabbitbrush (*Chrysothamnus nauseosus*), and snakeweed may be present in some stands. Common graminoid species include cheatgrass, Indian ricegrass, squirreltail, galleta grass (*Pleuraphis jamesii*), thickspike wheatgrass (*Elymus lanceolatus*), western wheatgrass (*Pascopyrum smithii*), bluebunch wheatgrass, needle-and-thread grass (*Hesperostipa comata*), and Sandberg bluegrass (*Poa secunda*). Coppermallow (*Sphaeralcea coccinea*) and tapertip onion (*Allium acuminatum*) are common forbs.

Environmental Consequences

Proposed Action

Construction of the proposed pads, pipelines, and access roads would result in both direct and indirect effects on vegetation. Direct effects would include short and long-term loss of vegetation and long-term modification of community structure and composition. Indirect effects could include increased potential for noxious weed invasion, increased soil erosion and sedimentation, reduced wildlife habitat quantity or quality, and changes in fire regime.

The Proposed Action would result in the short-term loss of approximately 68 acres of vegetation. Of the 68 acres of physical disturbance, approximately 20 acres would not be reclaimed during the life of the wells. With implementation of standard COAs, desirable forbs and grasses on the unused portions of the pads, roads, and pipelines could be established within 2 to 3 years. However, because of periodic workovers and the potential for additional well bores in the future, it is likely that vegetation would remain in an early seral stage for the life of the wells.

Although vegetation would regenerate over time, this process could take several decades, depending on the growth and persistence of seeded species and the intensity of grazing by livestock or wildlife. Pinyon-juniper woodlands could take hundreds of years to return to predisturbance conditions. This would result in an increase in the proportion of herbaceous (i.e., non-woody) species in the areas of disturbance. The success or failure of revegetation would affect other resources including soils, surface water quality, wildlife, visual resources, and livestock grazing.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

Analysis on Public Land Health Standard 3 for Plant and Animal Communities (partial, see also Wildlife, Aquatic and Wildlife, Terrestrial)

This area was meeting the standard, although problems were noted: invasive weeds, inadequate litter cover and the decline in diversity and abundance of functional groups such as cool-season perennial grasses and perennial forbs. Noxious weeds and undesirable species varied in distribution and cover throughout the Divide Creek Landscape. Due to the intensity of uses and activities occurring in the landscape, noxious weeds were common on a number of sites, particularly at the lower elevations.

Surface disturbance associated with the Proposed Action has the potential to encourage expansion and dominance of the site by invasive, non-native species. Appendix A includes provisions to revegetate the disturbances with native species and to control noxious weeds. If successfully revegetated, the Proposed Action should not contribute to the failure of the area to meet Standard 3.

The No Action Alternative would have no bearing on the ability of the area to meet the public land health standard for plant and animal communities because no new development would occur on BLM land.

3.18 Visual Resources

Affected Environment

The Proposed Action would occur on public lands southeast of Silt within areas classified as Visual Resource Management (VRM) Class III, as identified in the 1984 Glenwood Springs Resource Management Plan. The objective for VRM Class III, as defined in the BLM's Manual H-8410-1 – Visual Resource Inventory (BLM 1986), is described below.

- The objective of VRM Class III is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should 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.

The visual resource analysis area includes the I-70 viewshed corridor south of I-70 between Silt and Garfield Creek and CR 311 (Divide Creek Road) south of Silt from CR 335 (Colorado River Road) to CR 313 (East Divide Creek Road). This area is viewed by people who live, work, recreate, and travel through the area. Jolley Mesa, south side of I-70 and east of CR 311, is the dominant topographic feature in the visual resource analysis area. The visual resource inventory area is characteristic of rural agricultural/ranching land and scattered rural residences. The Proposed Action would occur in two different areas within the MDP Boundary, each with a slightly different landscape character.

Pads 21, 22, and 23 and associated access roads/pipeline occur in area that is more of an enclosed landscape with a bowl-like character. Each pad, with the exception of Pad 21, is located on gently sloping open sagebrush flats surrounded by gentle to moderate rolling hills dominated by dense, dark-green pinyon/juniper plant communities interspersed with patches of tan, exposed soil. Pad 21 has the same vegetation characteristic but sits in an east to west direction nestled between two topographic features (one to the north and one to the south). The northern side of the pad has a dramatic steep rocky face, whereas the southern side of the pad is not as dramatic or prominent. The northern edge of the pad will be more exposed than the southern edge. Pad 22 slopes from the southeast to the northwest, with the southeastern corner being potentially more exposed. Pad 23 is even more enclosed than Pad 21 and Pad 22 and slopes to the southwest, with minor drainages incising it. The visible exposure to Pads 21, 22, 23, and associated access roads would be very limited to northbound traffic between East Divide Road and Silt; and there may be limited exposure from the private lands to the west.

Pads 24, 25, and 26 and associated access roads/pipeline occur along the north facing slope of the Crown Peak Foothills. This area is characteristic of steep slopes incised by deep drainages. The pads, access road, and pipeline sit in a linear form following the contours from east to west. The vegetation is dominated by dense, dark-green pinyon/juniper plant communities interspersed with patches of tan exposed soil. The visible exposure to Pads 24, 25, 26, and the associated access roads would be limited to southbound traffic between Silt and CR 313, with some exposure from private lands to the west.

The visual impact analysis for the Proposed Action is based on the four views from Key Observation Points (KOPs) representing two linear viewer locations within the visual resource analysis area. The KOPs were selected because they were within the foreground/middle ground (3 to 5 miles) of the Proposed Action and represent locations where activities are closer to the viewer and may be viewed in more detail (Figure 6). In addition to analyzing the potential visual impacts of the proposed project immediately within the project area, a viewshed analysis was conducted to determine the effects of the project from observation or visibility corridors within and near the project area.

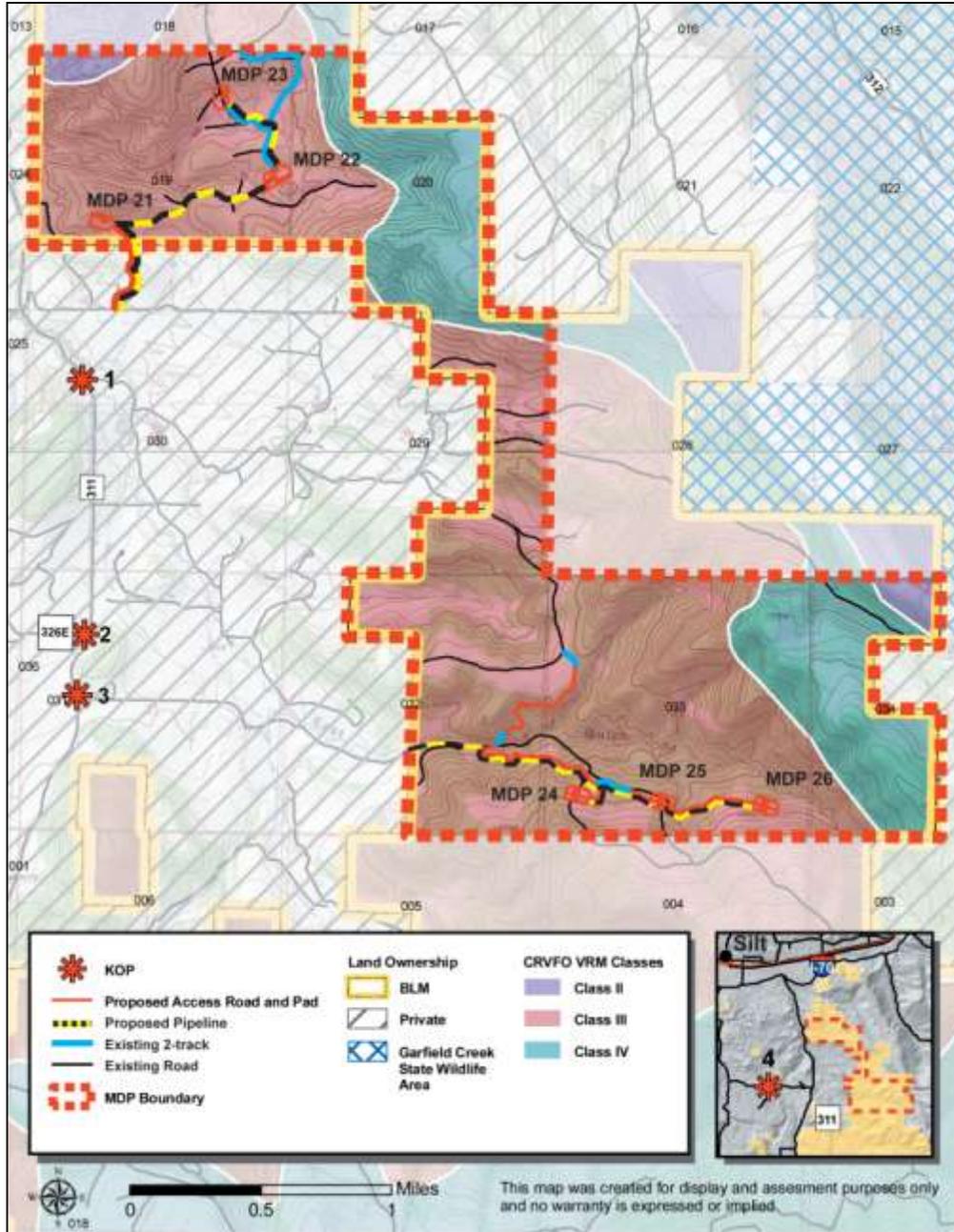
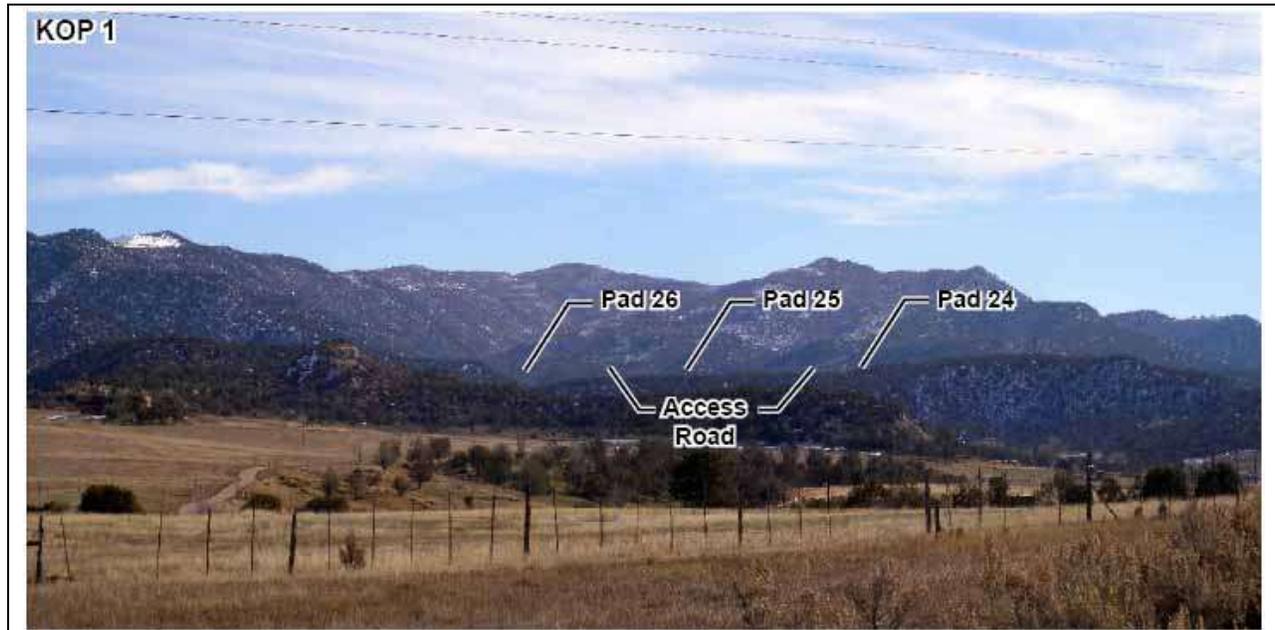


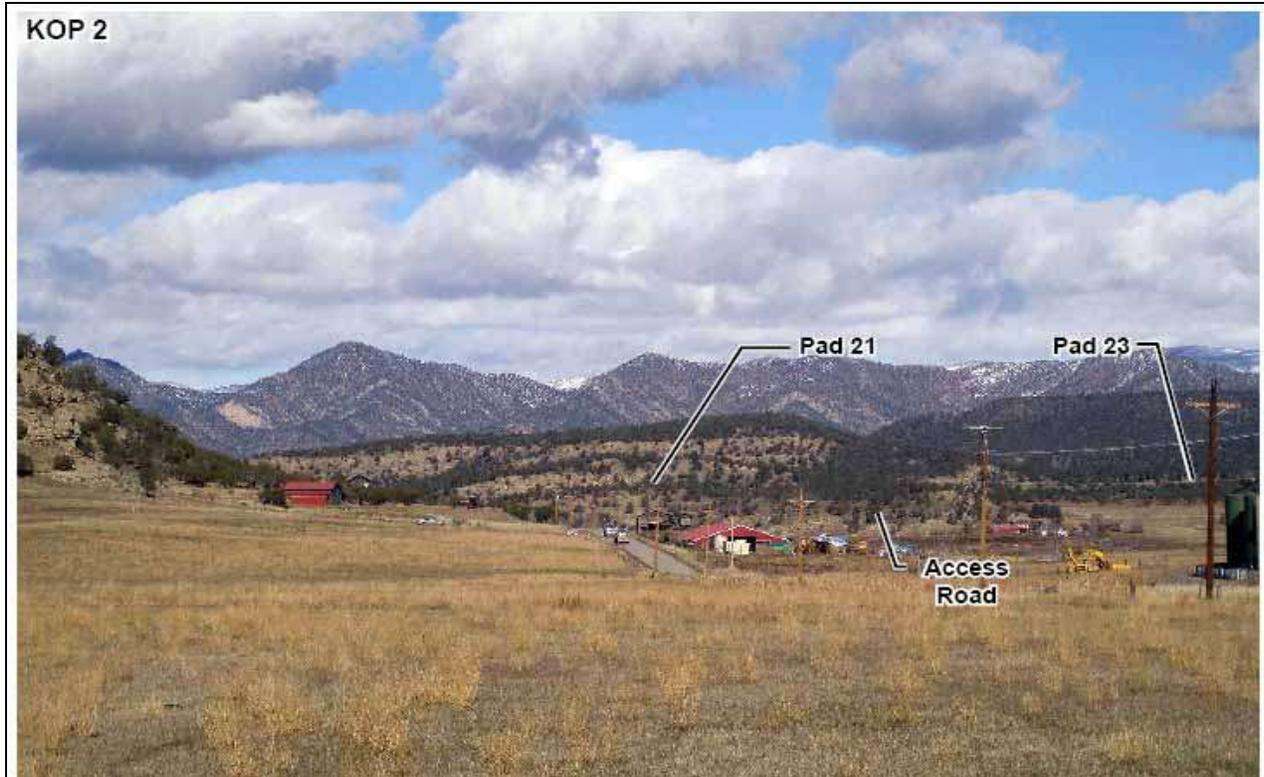
Figure 6. GGIIMDP Visual Resource Management (VRM) Class Designations



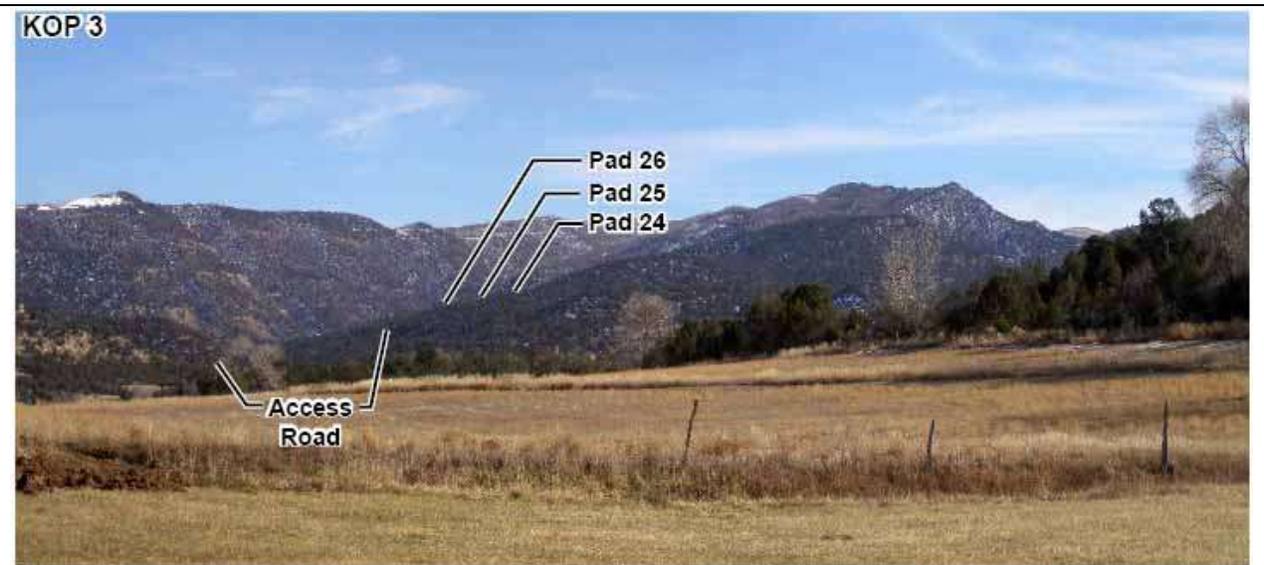
KOP 1 (view to the northeast) is located on County Road 311 (Divide Creek Road), representing the viewing angle and direction with the highest frequency of viewers. At this location, the viewer would be looking across toward the Proposed Action while driving north; at other locations along Divide Creek Road, the viewer may be higher than or equal to the Proposed Action. The foreground consists of gray-green sagebrush flats, dark-green pinyon/juniper stands draped on the rolling hillsides that rise to the north. Existing structures include rural agricultural/ranching facilities, scattered rural residences, and existing pads with associated facilities. The project area is less than 2 miles from this location, placing it in the foreground/middle ground.



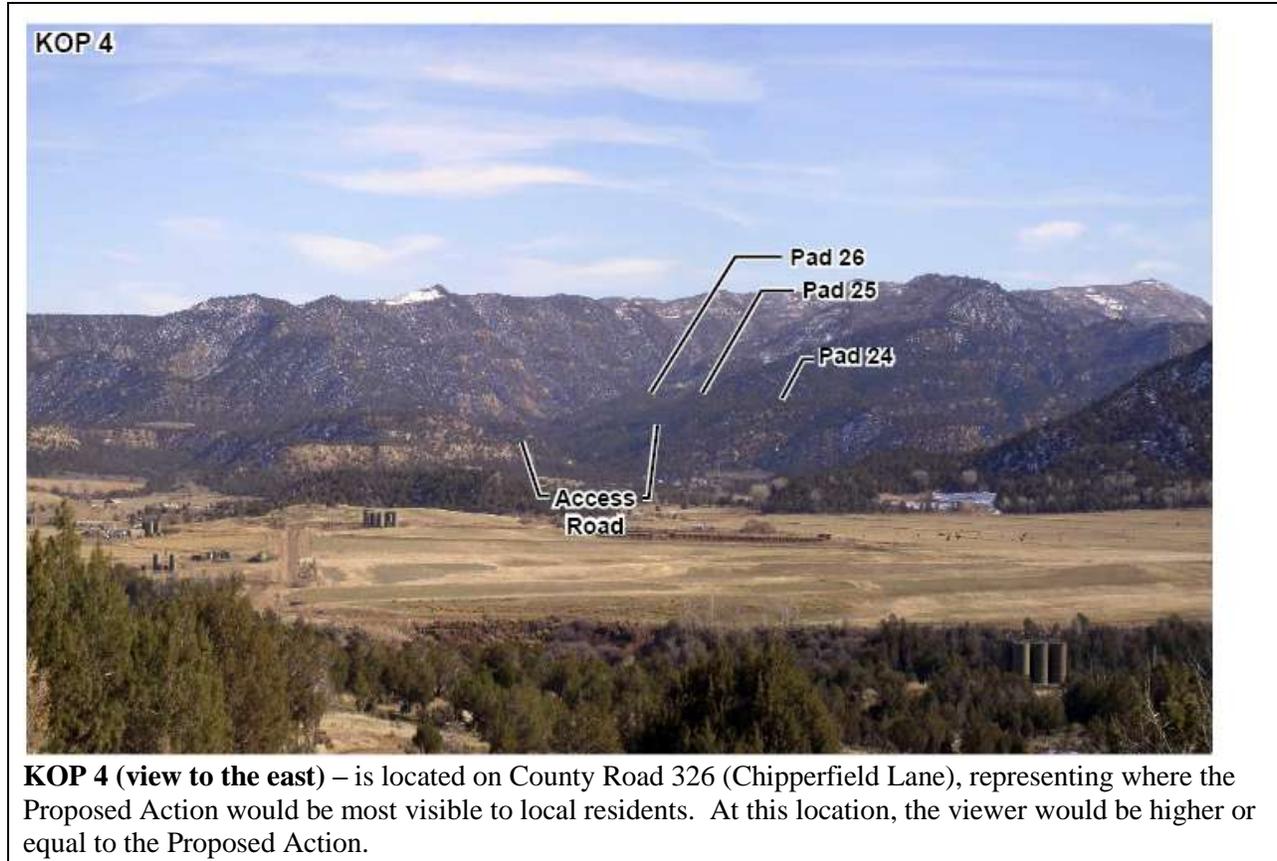
KOP 1 (view to the southeast) is located on County Road 311 (Divide Creek Road), representing the viewing angle and direction with the highest frequency of viewers. At this location, the viewer would be looking up toward the Proposed Action while driving south. The foreground consists of gray-green sagebrush flats, agricultural fields, and dark-green pinyon/juniper stands draping the rolling hillsides that rise to the south. The steep slopes of the Crown Peak foothills rise in the background. The project area is less than 4 miles from this location, placing it in the foreground/middle ground.



KOP 2 (view to the north) is located on CR 311, representing a location where the Proposed Action would be most apparent to viewers. At this location the viewer would be looking downward while driving north. The foreground is dominated by rural agricultural/ranching fields and facilities, scattered rural residences, and oil and gas development. The project area is less than 3 miles from this location, placing it in the foreground/middle ground.



KOP 3 (view to east) is located on CR 311 between two topographic features. From this location the viewer would be looking up toward the project area. The viewer would have a glimpse of the Proposed Action components rather than a prolonged view as from some other locations.



Environmental Consequences

Proposed Action

The planning process for this project involved several site visits where layout and locations for the pads, pipelines, and access roads were reviewed. Short-term visual impacts due to pad, access road, and pipeline construction, drilling, and completion activities would occur within the project area. The existing landscape would be changed by the introduction of contrasting elements within the landscape in the form of new lines, colors, forms, and textures.

Long-term impacts of the Proposed Action would consist of an increase in the departure from the native characteristics of the visual character within the landscape where the new pads, facilities, and roads are constructed. The visibility of new areas of surface disturbance and production equipment would increase the existing visual contrasts associated with human modification already present in the area.

The standard BMPs related to reclamation, facility paint colors, and screening the access road and pipeline alignment from view would largely mitigate long-term impacts. To ensure this, COAs in Appendix specify the following:

- All facilities shall be painted Shadow Gray in open areas and Shale Green when located in a pinyon/juniper stand.

- All cut-and-fill slopes shall have undulating contours which emulate the slopes seen in the adjacent landscape. Constructed slopes shall meet existing grades with a similar slope to eliminate the line created at the edge where two different grades meet.
- All woody vegetation shall remain standing at the toe of the fill slope and the top of the cut slope to provide visual screening. During interim reclamation, vegetation shall be protected and remain standing and undamaged when fill material is pulled back to recontour the pad.
- In areas where clearing in dense vegetation is required, thinning and feathering of the adjacent vegetation shall be incorporated. Thinning and feathering will reduce the hard line between the new construction and the existing vegetation. Material from felled trees shall be stockpiled for dispersing over seeded areas, creating microclimates and habitats, encouraging vegetation growth, and providing small species cover.
- Access roads and pipeline corridors shall follow natural contours so they conform to the landscape and reduce the amount of cut and fill required to meet grade and to eliminate distant, straight line impacts.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

3.19 Wastes, Hazardous or Solid

Affected Environment

The affected environment for hazardous materials includes air, water, soil, and biological resources that may potentially be affected by an accidental release of hazardous materials during transportation to and from the project area, storage, and use in construction and operations. Sensitive areas for hazardous materials releases include areas adjacent to water bodies, above aquifers, and areas where humans or wildlife would be directly impacted.

BLM Instruction Memoranda numbers WO-93-344 and CO-97-023 require that all NEPA documents list and describe any hazardous and/or extremely hazardous materials that would be produced, used, stored, transported, or disposed of as a result of a proposed project. The GSRA Oil & Gas Leasing & Development, Draft Supplemental Environmental Impact Statement (June 1998), Appendix L, Hazardous Substance Management Plan, contains a comprehensive list of materials commonly used for oil and gas projects. It also includes a description of the common industry practices for these materials and disposal of waste products. These practices are dictated by various Federal and State laws and regulations, and the BLM standard lease terms and stipulations that would accompany any authorization resulting from this analysis. The most pertinent Federal laws dealing with hazardous materials contamination are as follows:

- The Oil Pollution Act (Public Law 101-380, August 18, 1990) prohibits discharge of pollutants into waters of the US, which by definition would include any tributary, including any dry wash that eventually connects with the Colorado River.
- The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, Public Law 96-510 of 1980) provides for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment. It also provides national, regional, and local contingency plans. Applicable emergency operations plans in place include

the National Contingency Plan (40 CFR 300, required by section 105 of CERCLA), the Region VIII Regional Contingency Plan, the Colorado River Sub-Area Contingency Plan (these three are Environmental Protection Agency [EPA] produced plans), the Mesa County Emergency Operations Plan (developed by the Mesa County Office of Emergency Management), and the BLM Grand Junction Field Office Hazardous Materials Contingency Plan.

- The Resource Conservation and Recovery Act (RCRA) (Public Law 94-580, October 21, 1976) regulates the use of hazardous substances and disposal of hazardous wastes. Note: While oil and gas lessees are exempt from RCRA, right-of-way holders are not. RCRA strictly regulates the management and disposal of hazardous wastes.

In the event of a spill or accidental release, the operator is required to implement its Spill Prevention, Control, and Countermeasures (SPCC) plan, including such cleanup and mitigation measures as required by BLM or the State. Emergency response to hazardous materials or petroleum products on BLM lands are handled through the BLM Grand Junction Field Office contingency plan. The BLM would have access to regional resources if justified by the nature of an incident.

Environmental Consequences

Proposed Action

Possible pollutants that could be released during construction of the project include diesel fuel, hydraulic fluid, and lubricants. These materials would be used during construction of pads, roads, and pipelines, and refueling and maintaining equipment and vehicles. Potentially harmful substances used in construction and operation phases would be kept onsite in limited quantities and trucked to and from the site as required. No hazardous substance, as defined by 40 CFR 355 would be used, produced, stored, transported, or disposed of in amounts above threshold quantities. Waste generated by construction activities would not be exempt from hazardous waste regulations under the oil and gas exploration and production exemption of RCRA. Exempt wastes would include those associated with well production and transmission of natural gas through the gathering lines and the natural gas itself.

With the exception of produced hydrocarbons, ethylene glycol (antifreeze), lubricants, and amine compounds, chemicals subject to reporting under Title III of the Superfund Amendments and Reauthorization Act in quantities of 10,000 pounds or more would not be used, produced, stored, transported, or disposed of during construction or operation of the facilities. None of the chemicals that would be used in construction meet the criteria for an acutely hazardous material/substance, or meet the quantities criteria per BLM Instruction Memorandum No. 93-344. In addition, no extremely hazardous substance, as defined in 40 CFR 355, in amounts above threshold planning quantities would be produced, used, stored, transported, or disposed of during construction or operation of the facilities.

Solid waste (human waste, garbage, etc.) would be generated during construction activities and project operations. These would be removed to a landfill or water treatment facility as needed, and all would be removed prior to interim reclamation.

Surface water or groundwater could be impacted under the Proposed Action. Pollutants that might be released during the operational phase of the project could include condensate, produced water (if the wells in the area produce water) and glycol (carried to the site and used as antifreeze). While uncommon, an accident could occur that could result in a release of any of these materials. A release could result in contamination of surface water or soil. Improper casing and cementing procedures could result in the contamination of groundwater resources. In the case of any release, emergency or otherwise, the responsible party would be liable for cleanup and any damages. Depending on the scope of the accident,

any of the above referenced contingency plans would be activated to provide emergency response. At a minimum, the BLM Grand Junction Field Office contingency plan would apply.

These laws, regulations, standard lease stipulations, and contingency plans and emergency response resources are expected to adequately mitigate any potential hazardous or solid waste issues associated with the Proposed Action.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

3.20 Water Quality, Surface and Ground

Surface Water (includes an analysis on Public Land Health Standard 5)

Affected Environment

The proposed activities for the GGIIMDP including pads, access road, and pipelines would occur entirely within Lower Divide Creek 6th code hydrologic unit which drains to the perennial Divide Creek and finally empties into the Colorado River. Development of MDP 24, 25 and 26 pads, access roads, and pipelines in Section 33 drain to Divide Creek approximately 2 miles northwest, which flows another 3 miles to the Colorado River. Development of MDP 21, 22, and 23 pads, access roads, and pipelines in Section 19 drain to Divide Creek approximately 2 miles northwest and another 1 mile to the Colorado River. According to *Stream Classifications and Water Quality Standards* (CDPHE, Water Quality Control Commission [WQCC] Regulation No. 37) (CDPHE 2007), unnamed ephemeral drainages that drain most of the project vicinity are within segment 7b, which includes the mainstem and tributaries to Divide Creek from the boundary of White River National Forest to the Colorado River confluence.

- Segment 7b – This segment has been classified as aquatic life cold 1, recreation E, water supply, and agriculture. Aquatic life cold 1 indicates that this water course is currently capable of sustaining a wide variety of cold water biota, including sensitive species, or could sustain such biota but for correctable water quality conditions. Recreation class E refers to waters with existing primary contact uses. Water supply and agriculture are as described for segment 4a.

Streams within segment 7a are not on the State of Colorado 303(d) List of Impaired Waters and Monitoring and Evaluation List (CDPHE, WQCC Regulation No. 93) (CDPHE 2010). The segment of the Colorado River which Divide Creek empties is on the *Monitoring and Evaluation List* for sediment load. The USGS has collected limited surface water flow and quality data at sites along Divide Creek. Water quality data are also available for the Colorado River near Rulison, located several miles downstream of the confluence of Baldy Creek (USGS 2007). These data are presented in Table 14.

The segment of the Colorado River into which Divide Creek empties is on the *Monitoring and Evaluation List* for sediment load. The closest downstream water quality station that measures sediment on the Colorado River is near DeBeque, Colorado. A summary of USGS data collected at this station indicates the mean sediment load was 1,817 tons per day from 1974 to 1976. The maximum and minimum for this location during the same period was 41,300 and 8 tons/day respectively (USGS 2007). Because of the distance from Divide Creek—with numerous intervening perennial and ephemeral tributaries, many of

which drain steep, poorly vegetated, erodible areas—water quality of the Colorado River near the inflow of Divide Creek is expected to differ significantly from that at either the Rulison or De Beque stations.

Table 14. Selected Water Quality Data for Sampling Locations near the Project Area			
<i>Parameter</i>	<i>Divide Creek near Silt, CO USGS Site #393225107372 10/15/2003</i>	<i>Divide Creek near Silt, CO USGS Site #393120107365 8/09/79</i>	<i>Colorado River below Rulison, CO USGS Site #09092570 4/8/77</i>
Instantaneous discharge (cfs)	1.1	6.7	1,500
Temperature, water (°C)	30	20	2.5
Field pH (standard units)	8.5	7.7	7.9
Specific conductance (µS/cm/cm at 25°C)	1,020	575	1,320
Total Dissolved Solids (mg/L)	988	496	756
Hardness as CaCO ₃ (mg/L)	622	150	280
Chloride (mg/L)	41	24	230
Selenium (µg/L)	6.6	NA	2
Note: NA = data not available Source: USGS 2007.			

Environmental Consequences

Proposed Action

The Proposed Action would result in approximately 68 acres of surface disturbance for pad, road, and pipeline construction. The long term disturbance would be approximately 20 acres of access roads and pad area that are required to be in service for the life of the wells. Potential impacts to surface water associated with the Proposed Action occur from surface-disturbing activities, traffic, waste management, and the use, storage and transportation of fluids (i.e., chemicals, condensate, and produced water). Surface-disturbing activities associated with well and facility pads, roads, and pipelines cause loss of vegetation cover, soil compaction and displacement, increased volume and velocity of runoff, and increased sedimentation and salinity in surface waters. Initially, impacts can be minimized by stormwater management, stockpiling topsoil, controlling erosion, and rehabilitation of disturbed surfaces quickly. Long term soil protection could be achieved by continued road and pad maintenance to reduce erosion, remediation of contaminated soils and minimizing the size of the long-term pad footprint through interim reclamation measures. As proposed, these measures would include limiting cut slope steepness, step-cutting, crowning road surfaces, installing culverts and drainage systems, and applying gravel to all upgraded BLM roads in the project area to a compacted thickness of 6 inches (Appendix A).

Oil and gas waste management practices have the potential to contaminate soils and surface water. Contamination of soils could cause long-term reduction in site productivity resulting in increased erosion and potential sediment and contaminant delivery to nearby waterways during runoff. Use, storage, and transportation of fluids such as produced water, hydraulic fracturing fluids, and condensate have the possibility of spills that could migrate to surface or groundwater. Tanks used to store produced water and condensate would be placed in secondary containment to prevent offsite release. Other elements of the Proposed Action are designed to mitigate risks to surface waters associated with the release of drilling fluids, produced water, and condensate. A closed-loop drilling system would be implemented. In this process, drilling fluids are recycled, and cuttings are dried through the use of a shaker system, remediated, and stacked against the cutslope on the pad or hauled offsite. A traditional reserve pit would not be constructed. Cuttings management areas must be decontaminated to COGCC standards prior to pit

closure. Implementation of the standard COAs for mitigating impacts to surface waters (Appendix A) would minimize risks of adverse impacts associated with construction and ongoing production activities.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

Analysis on Public Land Health Standard 5 for Water Quality

The 2009 Divide Creek LHA found water quality in stream segments in the area to be good, meeting the majority of state standards and meeting LHA Standard 5. Water quality on the mainstem of Divide Creek is meeting state standards. With proper techniques for crossing streams, restoring disturbed streambanks and channels, controlling erosion and sedimentation, preventing spills, and revegetating disturbed areas (see COAs in Appendix A), the Proposed Action would not prevent Standard 5 from being met.

Waters of the U.S.

Affected Environment

Waters of the U.S. located in the project vicinity include the mainstem and tributaries of Divide Creek. Section 404 of the Clean Water Act requires a Department of the Army permit from the U.S. Army Corps of Engineers (USACE) prior to discharging dredged or fill material into waters of the U.S. as defined by 33 CFR Part 328. A permit is required for both permanent and temporary discharges into waters of the United States; larger discharges require an individual permit, while smaller discharges may be granted a nationwide permit.

The existing access roads parallel the mainstem and tributaries of Divide Creek. Several locations along new or upgraded access roads will cross ephemeral drainages and would require a USACE 404 permit.

Environmental Consequences

Proposed Action

Crossings of Waters of the U.S. or streams that are potentially Waters of the U.S. are included in the Proposed Action. Locations of access roads which may require culverts and discharge fill in Waters of the US are presented in Table 15. It is not anticipated that any pad construction could discharge fill into Waters of the U.S.

Table 15. Waters of the US to be Crossed by Project Infrastructure		
<i>Stream Name</i>	<i>Crossing Location T6S, R 91W</i>	<i>Type of Crossing</i>
Ephemeral Branch of Divide Creek	SENE Sec. 19	Access Road
Ephemeral East branch of East Creek – tributary of Divide Creek	SESW Sec. 33	Access Roads
Ephemeral East branch of East Creek – tributary of Divide Creek	NWSW Sec 33	Access Road
Ephemeral East Creek – tributary of Divide Creek	SWNE Sec. 33	Access Road

Based on estimated impacts to Waters of the U.S., new construction, upgrades to the road, and pipeline crossings of drainages within the GGIIMDP would be authorized by the USACE. A COA in Appendix A requires that the operator obtain a formal jurisdictional determination by USACE prior to any construction that could affect Waters of the U.S., and verification that impacts do not require a permit.

Improperly designed crossings of small ephemeral drainages, in particular any undersized or poorly aligned culverts, could result in soil degradation, including erosion at culvert outlets. This could potentially supply sediment to Divide Creek and ultimately the Colorado River approximately 3 miles to the north. However, standard and site-specific surface-use COAs listed in Appendix A would be implemented to protect Divide Creek, the Colorado River, and any other Waters of the U.S. potentially impacted by long-distance stormflow transport.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

Groundwater

Affected Environment

The Lower Piceance Basin contains both alluvial and bedrock aquifers (Colorado Geological Survey 2003). Unconsolidated alluvial aquifers are the most productive aquifers in the region (EPA 2004) and are defined as narrow, thin deposits of sand and gravel formed primarily along stream courses, in this case, along the Colorado River and its tributaries. Alluvial well depths are generally less than 200 feet and water levels typically range between 100 to 150 feet. Well yield is dependent upon the intended use of the well, well construction design, sediment type and saturated thickness. Domestic use wells are limited to 15 gallons per minute (gpm) administratively, while municipal wells are designed and constructed for maximum potential yield.

The principal bedrock aquifers of the Piceance Basin are the Uinta Formation and the Parachute Creek Member of the Green River Formation, and are defined as the upper and lower Piceance Basin aquifer systems. The Uinta Formation consists of discontinuous layers of sandstone, siltstone, and marlstone and is less permeable than the hydrologically connected upper Parachute Creek Member (Robson and Saulnier 1981). The uppermost Uinta Formation also contains a shallow, perched aquifer that is separate from the upper aquifer unit (Cole et al. 1995). The upper Piceance Basin aquifer is underlain by the Mahogany confining unit, and correlates with the Mahogany Zone, the principal oil shale unit of the Piceance Basin. The Mahogany Zone separates the upper aquifer from the lower. The lower aquifer consists of the fractured marlstone of the lower part of the Parachute Creek Member. The thickness of the upper and lower aquifer units average 700 and 900 feet, respectively (CGS 2003). Both upper and lower aquifer systems are found within the surrounding cliffs of the project area, but no water wells are completed within either the upper or lower bedrock aquifers units as described above. Beneath these two aquifer systems is a confining unit which consists of the lower two members of the Green River Formation, and the Wasatch Formation. Although considered a confining unit, some fresh water wells are completed in the discontinuous water-bearing sands of the Wasatch Formation, but these water-bearing intervals are considered to be localized.

Below the Wasatch Formation is the Cretaceous-aged Mesaverde aquifer. The depth to the top of this aquifer beneath the project area is more than 5,000 feet below ground surface (bgs), far too deep for

economic development. The Mesaverde aquifer is of regional importance, but does not provide recharge into the fresh water system within the shallower groundwater system of the project area.

Water quality of the upper Piceance Basin aquifer unit is relatively good, ranging in Total Dissolved Solid (TDS) levels from 500 to 1,000 milligrams per liter (mg/L). In the lower unit, TDS concentrations increase from 1,000 to 10,000 mg/L along basin flow paths. Waters with TDS values in excess of 1,000 mg/L are generally unsuitable for potable supply. Water suitable for drinking has a Federal secondary standard set at 500 mg/L or less (EPA 2006). The quality of the water in the Mesaverde aquifer is highly variable, with concentrations of dissolved solids ranging from less than 1,000 mg/L in many of the basin-margin areas to more than 10,000 mg/L in the central part of the Piceance Basin (EPA 2004). In general, areas of the aquifer that are recharged by infiltration from precipitation or surface water sources contain relatively fresh water. However, water quality in the Piceance Basin is generally poor overall due to the presence of nahcolite deposits and salt beds throughout the basin. Only very shallow waters such as those from the surficial Wasatch Formation are used for drinking water (Graham 2001, cited in EPA 2004).

Five permitted domestic water wells are located within a 0.5-mile radius of the proposed project. The first three wells, located in the SW¹/₄ of Section 19, are listed as having depths between 81 and 162 feet, a static water level ranging from 15 to 20 feet bgs and an average discharge rate of 15 gpm. The next well, located in the NE¹/₄ of Section 20, is listed as having a depth of 160 feet, a static water level of 85 feet bgs and a discharge rate of 3 gpm. The final well, located in the NE¹/₄ of Section 2, is listed as having a depth of 128 feet, a static water level of 18 feet bgs, and a discharge rate of 3.5 gpm.

Environmental Consequences

Proposed Action

Potential impacts to groundwater resources from the proposed development would include contamination of the groundwater with produced water, drilling mud, and petroleum constituents. Hydraulic fracturing would be incorporated to create additional pathways to facilitate gas production. Agents called proppants” used to prop open the fractures are mixed with both fresh water and produced water. Typical proppants include sand, aluminum, glass, or plastic beads, with less than 1% of other compounds such as corrosion-, friction-, and scale-inhibitors (EnerMax Inc. 2007). Fracing techniques are used to create secondary porosity fractures, held open by proppants, allowing the otherwise trapped gas to migrate up the borehole for production. Hydrofracturing would be conducted at 5,000 feet or more bgs. Drilling scenarios are developed to prevent fluids and produced hydrocarbons from migrating upward into fresh water zones. Geologic and engineering reviews are conducted to ensure that the cementing and casing programs are adequate to protect all downhole resources. With the use of proper construction practices, drilling practices, and BMPs, no significant adverse impact to groundwater aquifers is anticipated to result from the project (see Downhole COAs in Appendix A).

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

3.21 Wildlife, Aquatic (includes an analysis on Public Land Health Standard 3)

Affected Environment

Garfield and Divide Creeks are not located within the project boundary but are perennial streams located to the east and west of the project, respectively. Fish sampling conducted by the CPW (2011b) has documented speckled dace (*Rhinichthys osculus*), creek chub (*Semotilus atromaculatus*), and rainbow trout (*Oncorhynchus mykiss*), in Garfield Creek. In Divide Creek, speckled dace, creek chub, roundtail chub flannelmouth sucker, and bluehead sucker were found. Jackson Gulch, East Gulch, and other unnamed tributaries within the project boundaries that drain into Garfield and Divide Creeks are ephemeral and therefore do not support fish. Both Garfield and Divide Creeks drain directly into the Colorado River located approximately 0.5 mile to the north. The Colorado River supports numerous native and non-native fish species and a variety of aquatic macroinvertebrates.

Aquatic macroinvertebrates living in perennial streams such as Garfield Creek and Divide Creek during a portion of their lifecycles include larvae of stoneflies, mayflies, and some caddisflies in fast-flowing reaches with rocky or detrital substrates. Both the aquatic larvae and winged adults of stoneflies, mayflies, and caddisflies are probably the main prey for trout in Garfield Creek, along with terrestrial invertebrates that land or fall onto the surface or are carried into the stream in runoff from adjacent uplands. In slow-flowing portions of Garfield Creek and Divide Creek with fine substrates, aquatic macroinvertebrates probably include the larvae of midges, mosquitoes, and some caddisflies. These species are able to tolerate relatively warm, turbid, and poorly oxygenated waters, and their more abbreviated larval stages allow them to reproduce in intermittent streams and in seasonally inundated overbank areas.

See the Special Status Species section for discussion of other aquatic wildlife species in the area.

Environmental Consequences

Proposed Action

Construction activities associated with the proposed project would initially remove approximately 68 acres of upland vegetation. Some areas would be revegetated but total long-term upland habitat loss would total about 20 acres. This would result in both short-term and long-term erosion and soil loss. Short-term losses would result where all soils are disturbed until such time as proper revegetation is in place to stabilize soils. Long-term soil loss and sedimentation would be associated with the new roads, which would be in place and in use for several years. Sediment can impact some fish species that prefer clear water and clean gravels for spawning. Sediment can smother fish eggs, reduce water quality, and also reduce aquatic insect productivity. Due to the proximity of the Proposed Action to Garfield and Divide Creeks, protective COAs for groundwater/soils and surface and groundwater quality would minimize potential impacts from the Proposed Action (Appendix A).

The small amount of sediment anticipated to reach the Colorado River would have minimal impact on fisheries, because it would be well within background levels and probably undetectable. Habitat for the fish population in nearby streams would remain adequate by maintaining the present condition of the aquatic and riparian environment of Garfield Creek and Divide Creek.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee

location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

Analysis on Public Land Health Standard 3 for Plant and Animal Communities (partial, see also Vegetation and Wildlife, Terrestrial)

A formal LHA was completed in 2009 for the portion of the CRVFO that includes the GGIIMDP area. Under the Proposed Action, increased erosion and sedimentation to drainages in the GGIIMDP area, as well as the increased potential for soil contamination from leaks or spills of fuels or lubricants, have the potential to trend the area away from meeting this standard. However, with implementation of applicant-committed environmental mitigation measures and standard surface-use COAs, the Proposed Action would not be expected to prevent Standard 3 from being met for aquatic wildlife.

3.22 Wildlife, Terrestrial (includes an analysis on Public Land Health Standard 3)

Affected Environment

Mammals

Many terrestrial animals are known to exist in the project area. The following summary focuses on species for which seasonal ranges have been delineated by CPW (2011a) and for which BLM has outlined associated management objectives. The GGIIMDP area is located within overall range for mule deer (*Odocoileus hemionus*) as well as winter range, winter concentration area, and severe winter range for both mule deer and Rocky Mountain elk (*Cervus elaphus nelsonii*) (CPW 2011a). Winter range is that part of the overall range of a species where 90% of the individuals are located during the average five winters out of ten from the first heavy snowfall to spring green-up, or during a site-specific period of winter as defined for each data analysis unit (DAU). Severe winter range is that part of the range of a species where 90 percent of the individuals are located when the annual snowpack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten. Winter Concentration areas are that part of the winter range where densities are at least 200% greater than the surrounding winter range density during the same period used to define winter range in the average five winters out of ten. Field surveys indicate that the project area is occupied winter range for elk and that mule deer occupy on a year-round basis.

The CPW monitors and manages these populations in Data Analysis Units (DAU) and Game Management Units (GMU). The site is found in deer DAU D-12, and elk DAU E-14, and in GMU 42. Numbers of mule deer and elk vary naturally due to a variety of environmental and biological factors and in response to hunting pressure. As a result, populations have varied dramatically over the past several decades. Mule deer numbers were substantially higher in the early 1960s, subsequently declined dramatically, but are gradually recovering. Elk numbers have also varied in response to winter die-offs and probably other factors but have steadily increased over the past several years. Past use coupled with ongoing current use of limited winter range habitats by both species may at least in part account for the less than desirable range conditions (browse species condition) found in some areas. Mule deer and elk concentration on winter range and repeated heavy use of browse species can reduce plant vigor and productivity over time.

Factors related to localized deer and elk populations include increasing oil and gas development; construction of linear infrastructure such as roads, powerlines, and pipelines; industrial, commercial, and residential development associated with the overall human population growth of the area; and disturbance associated with increased human presence and activity in areas of winter range. The potential for impacts to localized deer and elk populations from these factors is exacerbated by the fact that winter range

habitats are relatively limited in areal extent and, being located at lower elevations, in more gentle terrain, and along major transportation corridors are also the areas within which habitat loss from land development is concentrated.

Federal leases associated with the GGIIMDP have a TL stipulation to reduce impacts to seasonally important use by deer and elk of winter range. This TL prohibits construction, drilling, or completion activities from December 1 through April 30 on lands overlying Federal lease COC66718 and from January 16 through April 29 on lands overlying Federal leases COC46972, COC50126, and COC51440.

Large carnivores present in the project vicinity include the mountain lion (*Puma concolor*) and black bear (*Ursus americanus*). Mountain lions move seasonally to generally follow migrations of their preferred prey, mule deer. Two medium-sized carnivores, the coyote (*Canis latrans*) and bobcat (*Lynx rufus*), are also present throughout the region in open habitats and broken or wooded terrain, respectively, where they hunt for small mammals, reptiles, and ground-dwelling birds. Smaller carnivores in habitats similar to those near the project site include the ringtail (*Bassariscus astutus*) and spotted skunk (*Spilogale gracilis*).

Small mammals present within the planning area include rodents such as the rock squirrel (*Spermophilus variegatus*), golden-mantled ground squirrels (*Spermophilus lateralis*), least chipmunk (*Tamias minimus*), and packrat (bushy-tailed woodrat) (*Neotoma cinerea*), as well as the mountain cottontail (*Sylvilagus nuttallii*). Rodents and, to a lesser extent rabbits, are the primary prey base for a variety of avian and mammalian predators.

Birds

The wild turkey (*Meleagris gallopavo*) is native to North America and is the largest of the upland fowl. Wild turkeys are omnivorous, foraging on the ground or climbing shrubs and small trees to feed. They prefer eating hard mast such as acorns and pinyon nuts, as well as various seeds, berries, roots, and insects. Wild turkeys often feed in cow pastures and are also known to eat a wide variety of grasses. The GGIIMDP is located within an area mapped by the CDPW as wild turkey overall range.

See the sections on Migratory Birds and Special Status Species for discussions of other birds in the area.

Reptiles and Amphibians

Species most likely to occur include the western fence lizard (*Sceloporus undulatus*) and gopher snake (bullsnake) (*Pituophis catenifer*) in xeric shrublands or grassy clearings and the western terrestrial garter snake (*Thamnophis elegans*) along creeks. Other reptiles potentially present along creeks, although more commonly found at lower elevations than the site, are the milk snake (*Lampropeltis triangulum*) and smooth green snake (*Opheodrys vernalis*).

Though the project area does not contain any suitable habitat, the surrounding area provides potentially suitable habitat for the northern leopard frog (see the section on Special Status Species) and two additional amphibians, the Woodhouse's toad (*Bufo woodhousii*) and western chorus frog (*Pseudacris triseriata*). Within the CRVFO and vicinity, Woodhouse's toad occurs primarily in slow-flowing seasonal streams, temporarily flooded overbank areas along perennial streams, or in ponds that do not contain predator fish. The chorus frog occurs primarily in cattail and bulrush wetlands and the vegetated margins of ponds and streams. See the Special Status Species section for discussion of other reptiles and amphibians in the area.

Environmental Consequences

Proposed Action

The Proposed Action is estimated to result in the direct loss or fragmentation of approximately 68 acres of wildlife habitat in the project area due to construction of new well pads, access roads, and pipelines. Reclamation of pipelines and temporary disturbances associated with road construction and interim reclamation of well pads would reduce this total to approximately 20 acres for the remainder of oil and gas production. Reclamation activities would benefit some wildlife species by increasing herbaceous forage. In areas where shrubs and trees would be disturbed, impacts to wildlife from loss of thermal and/or hiding cover would be long-term, lasting the 20 to 30-plus years following reclamation that it would take for these woody species to re-establish.

Construction activities, soil disturbance, and traffic could potentially spur the introduction and spread of weed species within the project area. Weed invasion and establishment has become an increasingly important concern associated with surface disturbing activities in the West. Weeds often out-compete native plant species, rendering an area less productive as a source of forage for wildlife. However, implementation of the suggested mitigation measures in the Invasive, Non-Native Weeds section of this EA would minimize the potential for invasion and establishment of the project area by undesirable plants.

Indirect impacts on wildlife, especially big game and raptors, would be the disturbance caused by increased human activity, equipment operation, vehicle traffic, harassment by any dogs brought to the site by contractors, and noise related to drilling and completion activities. Most species of wildlife are relatively secretive and distance themselves from these types of disturbance or move to different areas screened by vegetation screening or topographic features. This avoidance, referred to as displacement, results in underuse of habitat near the disturbance. Avoidance of forage and cover resources adjacent to disturbance reduces habitat utility and the capacity of the affected acreage to support wildlife populations (BLM 1999a). Even when wildlife sensitive to disturbance do not avoid an area altogether, the changes in their movement patterns can result in greater use of less suitable habitats and increased physiological stress. These impacts are more significant during critical seasons such as winter, when cold temperatures, reduced forage quality, and reduced forage availability due to snow cover deplete their energy stores accumulated during summer and fall.

Another adverse impact of indirect habitat loss can occur in winter range that supports both deer and elk. Although these species compete to some extent for the same foods, particularly during winter, elk are generally able to tolerate colder temperatures and deeper snow cover. If disturbance from human activity and infrastructure affects the distribution of elk and causes them to congregate into smaller areas, the elk can out-compete deer for food and cause them to shift their patterns of use even farther. Assuming that some displacement of deer and elk does occur, winter range adjacent to the project area could also be indirectly affected and decline in quality as a result of increased use of those areas (White and Bartmann 1998). Another potential impact from greater concentrations of animals in areas to which affected animals are displaced is an increased risk for spread of infectious diseases.

The width of areas of indirect impact, or “effective habitat loss,” due to relative avoidance of otherwise suitable habitats depends on several variables. These include the type of habitat adjacent to the human activity (availability of topographic or vegetation screening), the extent and quality of habitat into which displaced animals might move, the intensity and duration of the disturbance, the seasonality of the disturbance, and the innate sensitivity of the particular wildlife species. The scientific literature contains a number of references to the width of indirect habitat zones along roads and other areas of disturbance. These include the following:

- Ward (1976) and Irwin and Peek (1979) reported reductions in use by elk within 400 meters (0.25 mile) of little-used, slow-speed National Forest roads. Hershey and Leege (1976) reported reduced use within 400 meters (0.25 mile) of forest roads in summer range. Lyon (1979) reported that use by elk was reduced by 37% within 0.1 mile of a road and by 57% within 0.2 mile. Pedersen (1979) and Rost and Bailey (1979) reported that use by elk decreased within 250 meters (820 feet) of paved roads. Czech (1991) reported reduced use within 500 meters of a logging road after it was opened to public use. Frederick (1991) found that 73% of use by elk occurred in the 50% of an area more than 400 meters (0.25 mile) from a road.
- Sawyer and Nielson (2005) reported that elk showed reduced use of areas within 2.8 kilometers (1.7 miles) of roads on summer range. In winter, the zone of reduced use was 1.2 kilometers (0.75 miles), which the authors attributed to reduced human use of the roads.
- Both Lyon (1979) and Perry and Overly (1976) noted that the actual extent of reduced habitat use along roads was affected by the amount of vehicular traffic and the density of nearby vegetation cover. Witmer and DeCalesta (1985) found that open spur roads showed a significant reduction up to 250 meters away.
- Witmer and DeCalesta (1985) found no reduction in use within 250 meters of spur roads after the roads were closed to vehicles. Edge and Marcum (1985) found that elk avoided logging roads by distances of 500 to 1,000 meters on working days but showed no avoidance of the roads on weekends. Similarly, Johnson et al. (1990) reported that elk returned to areas of both summer range and winter range when construction activities that had caused them to leave an area had ceased. Czech (1991) reported that tolerance of logging roads by elk was correlated with the distance to hiding cover.
- Knight et al. (2000) found that use by mule deer was reduced within 200 meters of a road (i.e., a road-effect zone of 200 meters, or 0.125 mile). Lyon (1979) found that the reduction in habitat use was greater in sagebrush than in pinyon/juniper, apparently due to difference in screening.

The following literature provides information specific to oil and gas activities:

- Hiatt and Baker (1981) found that an oil well drill pad was temporarily avoided but that the access road was not. Johnson et al. (1990) also found that elk avoided oil and gas activities temporarily but returned to these areas when the activities ceased. Knight (1980) reported that elk showed alarm responses when exposed to a continually shifting seismic exploration line but not in relation to regular activities at an oil and gas well pad and access road. Van Dyke and Klein (1996) reported that elk responses to oil drilling activities were not permanent but instead that “elk compensated for site-specific environmental disturbance by shifts in use of range, centers of activity, and use of habitat rather than abandonment of range.”
- Powell (2003) found reduced use by mule deer within 500 meters of oil and gas roads and drill pads in southwestern Wyoming during fall, winter, spring, and calving season (early summer). However, he did not collect data for narrower zones, so it is not known whether the overall reduction was uniform or greater in closer proximity to the disturbance, as would be assumed. The habitat type was a sagebrush shrubland with low topographic relief.
- Sawyer et al. (2006), in ongoing studies of oil and gas activities on mule deer in southwestern Wyoming, documented increasing avoidance of access roads during the first 3 years of development, with the average distance from wells to areas of highest use increasing from 2.1 to 3.7 kilometers (1.3 to 2.3 miles). However, deer distribution showed the opposite pattern during

the fourth year, with greater use near the wells than remote from them. The authors attributed this reversal in to the severe winter, since the well pads were located farther into the basin, at lower elevations, than the reference area that had no winter drilling. During the fifth year, with a relatively mild winter, deer distribution was the same as prior to drilling, which the authors interpreted as possibly indicating habituation.

In their final report, Sawyer et al. (2007) presented their findings relative to implementation of winter drilling combined with use of pipelines (which they called a “liquids gathering system [LGS]) to convey produced water and condensate as well as natural gas:

“[The] most effective mitigation measures for reducing impacts to mule deer will likely involve technology and planning that minimize the number of well pads and the human activity associated with them. Combined with careful planning, LGS [pipelines] and directional drilling represent two development strategies that provide effective means for reducing the number of well pads needed to recover gas resources and minimizing the amount of human activity at producing pads. Our results suggest that indirect habitat loss to mule deer may be reduced by approximately 38-60% when water and condensate products are collected in pipelines rather than being stored at well pads and hauled off with tanker trucks. Additionally, because [an] LGS can be installed underground and usually in existing pipeline corridors, the associated direct habitat loss is minimal. When directional drilling technology is used to drill multiple wells from a single pad, the amount of habitat loss is significantly reduced compared to a scenario where single wells are drilled from multiple pads. However, given the high levels of human activity associated with drilling, wildlife managers should expect considerable short-term displacement of wintering mule deer if year-round drilling is permitted in crucial winter range.”

BBC has committed to installing buried lines, equivalent to the liquid gathering system described above, to collect and convey produced water to centralized collection facilities. Use of pipelines instead of trucks to haul produced water is expected to reduce truck traffic—and associated disturbance—by thousands of trips per year, thereby reducing impacts to wildlife year-round.

BBC is expected to request an exception to the big game winter range TL stipulation that prohibits construction, drilling, and completion activities associated during a portion of the winter season (Appendix A). Such a request is expected to be for two to three pads per winter throughout the drilling phase of the project. BLM would consider requests for TL exceptions based on the location of the location of the specific pads and on mitigation measures proposed by BBC. A separate request would have to be made and considered each year.

Aspects of the Proposed Action that would reduce the severity of adverse impacts to big game ungulates, in addition to use of pipelines to convey produced water, include the following:

- BBC has designed the development using directional drilling from multi-well pads to reduce the amount of surface disturbance in relation to the number and spacing of downhole targets. As a result, the surface density of pads would be approximately 2.4 pads per square mile. The current land use plan for the CRVFO (BLM 1999:15) specifies a density of less than 4.0 pads per square mile as a management goal.
- Historically, operators relied on truck traffic to haul saline water produced with the natural gas. Increasingly, operators are using pipelines to move this water to reduce both the costs and the impacts associated with truck haulage.

- A BMP applied by COA to well permits would require that topsoil storage piles, stormwater control features, and cut-and-fill slopes undergo temporary seeding to stabilize the material and minimize weed infestations within 30 days following completion of pad construction (see Downhole COAS, Appendix A. Interim reclamation to reduce a well pad to the maximum size needed for production shall be completed within 6 months following completion of the last well planned for the pad.

Mitigation for wildlife impacts resulting from the development of Federal oil and gas leases is provided in the current CRVFO land use plan (BLM 1999), which requires operators to implement measures to reduce impacts to winter range if developments reach a predetermined level:

“Within high value or crucial big game winter range, the operator is required to implement specific measures to reduce impacts of oil and gas operations on wildlife and wildlife habitat....Measures to reduce impacts would generally be considered when well density exceeds four wells per 640 acres, or when road density exceeds three miles of road per 640 acres (BLM 1999:15).”

The threshold analyses of pad and road density for the GGIIMDP yield an average density for the six well pads (one existing and nine proposed) of one pad per 198 acres, or 3.2 pads per 640 acres, noticeably below the threshold of four pads per 640 acres. The total of 5.8 miles of access roads to be used to access the ten well pads yields an average road density of 1.6 miles per 640 acres, well below the threshold of 3.0 miles per 640 acres.

As noted above, BBC is expected to request an exception to the big game winter range TL that prohibits construction, drilling, and completion activities on BLM or split-estate lands during a portion of the winter season. Such a request is anticipated for at least the first winter season and probably for subsequent winters. If and when this occurs, BLM would work with BBC and CPW to identify mitigation measures sufficient for approving the request. Preliminary concepts discussed among the parties include implementing habitat treatments such as pinyon and juniper removal, sagebrush mowing, or seeding of native grasses in selected sagebrush areas; retaining selected hay meadows in an unmown condition or keeping cattle off mown meadows in fall; spraying with herbicides to control cheatgrass and other weeds; and closing and revegetating roadways within the project area that are unnecessary or impassable. All of these measures would increase the amount of forage for big game.

No Action Alternative

Under this alternative, the Federal APDs would not be approved, and new roads servicing the proposed pads would not be constructed. However, the one Fee well would likely still be drilled from a Fee location in the area. Therefore, any negative impacts related to construction, drilling, or completions would be largely avoided, but not eliminated.

Analysis on Public Land Health Standard 3 for Plant and Animal Communities (partial, see also Vegetation and Wildlife, Aquatic)

A formal LHA was completed in 2009 for the portion of the CRVFO that includes the project area. The LHA report will be published in 2010. Habitat loss and fragmentation and disturbance from human activity have the potential to trend the area away from meeting this standard. However, with implementation of the mitigation measures to be applied as COAs (Appendix A), the Proposed Action is not expected to prevent Standard 3 from being met.

4. SUMMARY OF CUMULATIVE IMPACTS

Until relatively recently, modifications of the region have been characteristic of agricultural and ranching lands, with localized industrial impacts associated with the railroad and I-70 corridors. More recently, these changes are cumulative to the growth of residential and commercial uses, utility corridors, oil and gas developments, and other rural industrial uses. These increasing activity levels have accelerated the accumulation of impacts in the area. Cumulative impacts have included: direct habitat losses; habitat fragmentation and losses in habitat effectiveness; elevated potential for runoff, erosion, and sedimentation; expansion of noxious weeds and other invasive species; and increased noise and traffic and reductions in the scenic quality of the area (BLM 1999a: 4-1 to 4-68).

In the past 5 years, oil and gas development in western Colorado has increased dramatically, including a substantial increase in production surrounding the GGIIMDP area. The GGIIMDP is located within the previously analyzed Gibson Gulch MDP (GGMDP) area in T6S R91W. The GGMDP was completed in 2009 and includes 131 wells on ten pads, totaling 82 acres of initial disturbance and 30 acres of long-term disturbance. The GGMDP project is nearing completion, and BBC is moving ahead with the second phase, GGIIMDP.

Completed in 2005, the Castle Springs Geographic Area Plan (GAP) includes areas in T7S R91W (abutting the proposed GGIIMDP to the south) planned for development of 98 wells from 18 well pads, with an associated compressor station. These components totaled approximately 55 acres of initial disturbance and 30 acres of long-term disturbance. The Antero Resources North Castle Springs MDP, completed in 2010, includes an additional 186 wells from seven pads, totaling 139 acres of initial disturbance and 61 acres of long-term disturbance. For the two projects combined, initial disturbance was projected at up to 194 acres, with interim reclamation reducing this to 91 acres of long-term disturbance.

Other oil and gas development has also been proposed, analyzed, and initiated in the general area surround the GGIIMDP. Completed in 2008, the Orion Energy (later sold to Williams Production) Kokopelli MDP, located in T6S R91W and abutting the GGIIMDP project area to the north, includes 163 wells on 16 pads six new pads and 10 existing pads, totaling 83 acres of initial disturbance and 36 acres of long-term disturbance.

The Dejour MDP, located approximately 1 mile due east of the GGIIMDP, was published in September 2011. It includes approximately 68 wells from four new pads, totaling 26.6 acres of initial disturbance and 16.7 acres of long-term disturbance.

In addition to the GAP and MDP developments listed above, a small number of additional wells and well pads have previously or recently been developed within or near the project area. Cumulatively with the GGIIMDP, these previous or pending GAP/MDP projects could include the following levels of development:

- 734 wells
- 61 well pads
- 453 acres of initial disturbance
- 194 acres of long-term disturbance

Although this total may appear large, the distribution of the approved or proposed facilities across a total of approximately 28 square miles within the combined project boundaries represents a pad density of approximately 2.2 per square mile, not a high density. This density is further reduced when considering the intervening undeveloped public and private lands in the vicinity of the GGIIMDP and nearby projects.

Therefore, the primary potential cumulative impact is probably related primarily to habitat fragmentation—particularly when miles of access road are added to acres of pads—rather than direct or indirect habitat loss. Several factors tend to ameliorate to some extent the potential for adverse impacts associated with both habitat loss or modification and habitat fragmentation:

1. Access roads generally consist of two types: (a) county or other heavily traveled roads that have historically fragmented the habitat, and (b) private or BLM access roads that would receive relatively light use after oil and gas developments move into long-term production and maintenance. Impacts to local residents and sensitive wildlife would decrease substantially in any given area following the initial period of development, and most species of wildlife are expected to be relatively tolerant of routine traffic associated with post-drilling and post-completion activities.
2. Recent proliferation in the use of pipelines instead of heavy trucks to haul fluids used in or produced by oil and gas development has already, and is expected increasingly to reduce disturbance to local residents as well as wildlife by reducing emissions of fugitive dust and vehicle exhaust, reduce impacts to air quality.
3. Modern methods such as closed-loop drilling to reduce or eliminate pits containing potentially toxic fluids, fracture-stimulation from remote locations, “simops” to more quickly drill and complete the wells on a pad, and directional drilling to reduce the number of pads per given number of wells are expected to reduce further the severity of potential impacts to humans, big game, and other resources.
4. The concurrent BLM/State permitting process attaches a number of best management practices or specific mitigation measures (e.g., see Appendix A) to minimize adverse impacts to human, wildlife, and abiotic receptors, including impacts that tend to decrease habitat patch size, contiguity, and connectivity as well as habitat quality and quantity.
5. Unlike other developments on private lands outside the jurisdiction of BLM—such as historic conversion of native habitats to hay pastures or other agricultural lands, historic conversion of native habitats or agricultural lands to sand and gravel operations along the Colorado River floodplain and adjacent terraces, and historic, ongoing, and likely future construction and expansion of residential, recreational, and commercial/industrial developments throughout the region—oil and gas projects such as the GGIIMDP are temporary in nature, eventually leading to plugging and abandonment of wells and reclamation of well pads and access roads.

The combination of these factors does not mean that project-specific or cumulative adverse impacts to humans, wildlife, air quality, water quality, and other resources will not occur. However, it does mean that adverse impacts associated with each project are avoided, minimized, or otherwise mitigated to an extent that supports a determination of no significant impacts for each project. Similarly, the BLM has concluded in that the cumulative impacts are also below the threshold of significance.

Nonetheless, while none of the cumulative impacts described in the 1999 FSEIS was characterized as significant, and while new technologies and regulatory requirements have reduced the impacts of some land uses, it is clear that past and present actions have had, and that these and reasonably foreseeable future actions will continue to have, adverse impacts on various elements of the human environment. The anticipated impact levels for existing and future actions range from negligible to locally major. Chief among these are:

- Residential, recreational, and commercial/industrial developments, which result in permanent habitat loss and fragmentation and increased human presence and use in an area.
- Construction or expansion of public roads, along with substantially increased traffic speeds and volumes, which result in habitat fragmentation, direct and indirect habitat loss, and direct mortality of some wildlife.

Although the Proposed Action would contribute incrementally to the cumulative adverse impact for some resources—including air quality, vegetation, migratory birds, big game ungulates, and visual and scenic quality—this contribution would be minor. For other resources and uses, the cumulative impacts would be negligible.

5. PERSONS AND AGENCIES CONSULTED

Bill Barrett Corporation: Doug Dennison, Jeff Fandrich, Jesse Merry, Tracy Fallang
 Colorado Parks and Wildlife: J.T. Romatzke, Will Spence

6. INTERDISCIPLINARY REVIEW

BLM staff from the CRVFO who participated in the preparation of this EA—including review of survey results submitted by the operator’s consultants, evaluation of impacts likely to occur from implementation of the Proposed Action, and identification of appropriate COAs to be attached and enforced by BLM—are listed in Table 16.

Table 16. BLM Interdisciplinary Team Authors and Reviewers		
<i>Name</i>	<i>Title</i>	<i>Areas of Participation</i>
Beth Brenneman	Ecologist	Invasive Non-native Species, Special-status Species (Plants), Vegetation
John Brogan	Archaeologist	Cultural Resources, Native American Religious Concerns
Vanessa Bull	Natural Resource Specialist	EA Project Lead, Access & Transportation, Noise, Range, Realty Authorizations, Recreation, Socioeconomics
Allen Crockett, Ph.D.	Supervisory NRS	NEPA Review
Bob Hartman	Petroleum Engineer	Downhole COAs
Shauna Kocman, Ph.D.	Hydrologist	Air Quality, Noise, Soils, Surface Water, Waters of the U.S.
Julie McGrew	Natural Resource Specialist	Visual Resources
Kimberly Miller	Outdoor Recreation Planner	Recreation
Isaac Pittman	Rangeland Management Specialist	Range
Sylvia Ringer	Wildlife Biologist	Migratory Birds, Special-status Species, Wildlife
Todd Sieber	Geologist	Geology and Minerals, Groundwater, Paleontology
DJ Beaupeurt	Realty Specialist, Energy	Rights-of-Way

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Appendix A
Standard and Site-Specific Conditions of Approval

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STANDARD SURFACE USE CONDITIONS OF APPROVAL

STANDARD COAS APPLICABLE TO ALL ACTIVITIES WITHIN THE GIBSON GULCH II MASTER DEVELOPMENT PLAN

The following standard surface use COAs are in addition to all stipulations attached to the respective Federal leases and to any site-specific COAs for individual well pads. Wording and numbering of these COAs may differ from those included in Gibson Gulch II MDP. In cases of discrepancies, the following COAs supersede earlier versions.

1. Administrative Notification. The operator shall notify the BLM representative at least 48 hours prior to initiation of construction. If requested by the BLM representative, the operator shall schedule a pre-construction meeting, including key operator and contractor personnel, to ensure that any unresolved issues are fully addressed prior to initiation of surface-disturbing activities or placement of production facilities.
2. Road Construction and Maintenance. Roads shall be crowned, ditched, surfaced, drained with culverts and/or water dips, and constructed to BLM Gold Book standards. Initial gravel application shall be a minimum of 6 inches. The operator shall provide timely year-round road maintenance and cleanup on the access roads. A regular schedule for maintenance shall include, but not be limited to, blading, ditch and culvert cleaning, road surface replacement, and dust abatement. When rutting within the traveled way becomes greater than 6 inches, blading and/or gravelling shall be conducted as approved by the BLM.
3. Dust Abatement. The operator shall implement dust abatement measures as needed to prevent fugitive dust from vehicular traffic, equipment operations, or wind events. The BLM may direct the operator to change the level and type of treatment (watering or application of various dust agents, surfactants, and road surfacing material) if dust abatement measures are observed to be insufficient to prevent fugitive dust.
4. Drainage Crossings and Culverts. Construction activities at perennial, intermittent, and ephemeral drainage crossings (e.g. burying pipelines, installing culverts) shall be timed to avoid high flow conditions. Construction that disturbs any flowing stream shall utilize either a piped stream diversion or a cofferdam and pump to divert flow around the disturbed area.

Culverts at drainage crossings shall be designed and installed to pass a 25-year or greater storm event. On perennial and intermittent streams, culverts shall be designed to allow for passage of aquatic biota. The minimum culvert diameter in any installation for a drainage crossing or road drainage shall be 24 inches. Crossings of drainages deemed to be jurisdictional waters of the U.S. pursuant to Section 404 of the Clean Water Act may require additional culvert design capacity. Due to the flashy nature of area drainages and anticipated culvert maintenance, the U.S. Army Corps of Engineers (USACE) recommends designing drainage crossings for the 100-year event. Contact the USACE Colorado West Regulatory Branch at 970-243-1199 ext. 17 (Travis Morse).

Pipelines installed beneath stream crossings shall be buried at a minimum depth of 4 feet below the channel substrate to avoid exposure by channel scour and degradation. Following burial, the channel grade and substrate composition shall be returned to pre-construction conditions.

5. Jurisdictional Waters of the U.S. The operator shall obtain appropriate permits from the U.S. Army Corps of Engineers (USACE) prior to discharging fill material into waters of the U.S. in accordance with Section 404 of the Clean Water Act. Waters of the U.S. are defined in 33 CFR Section 328.3

and may include wetlands as well as perennial, intermittent, and ephemeral streams. Permanent impacts to waters of the U.S. may require mitigation. Contact the USACE Colorado West Regulatory Branch at 970-243-1199 ext. 17 (Travis Morse). Copies of any printed or emailed approved USACE permits or verification letters shall be forwarded to the BLM.

6. Wetlands and Riparian Zones. The operator shall restore temporarily disturbed wetlands or riparian areas. The operator shall consult with the BLM Colorado River Valley Field Office to determine appropriate mitigation, including verification of native plant species to be used in restoration.
7. Reclamation. The goals, objectives, timelines, measures, and monitoring methods for final reclamation of oil and gas disturbances are described in Appendix I (Surface Reclamation) of the 1998 Draft Supplemental EIS (DSEIS). Specific measures to follow during interim and temporary (pre-interim) reclamation are described below.
 - a. Reclamation Plans. In areas that have low reclamation potential or are especially challenging to restore, reclamation plans will be required prior to APD approval. The plan shall contain the following components: detailed reclamation plans, which include contours and indicate irregular rather than smooth contours as appropriate for visual and ecological benefit; timeline for drilling completion, interim reclamation earthwork, and seeding; soil test results and/or a soil profile description; amendments to be used; soil treatment techniques such as roughening, pocking, and terracing; erosion control techniques such as hydromulch, blankets/matting, and wattles; and visual mitigations if in a sensitive VRM area.
 - b. Deadline for Interim Reclamation Earthwork and Seeding. Interim reclamation to reduce a well pad to the maximum size needed for production, including earthwork and seeding of the interim reclaimed areas, shall be completed within 6 months following completion of the last well planned to be drilled on that pad as part of a continuous operation. If a period of greater than one year is expected to occur between drilling episodes, BLM may require implementation of all or part of the interim reclamation program.

Reclamation, including seeding, of temporarily disturbed areas along roads and pipelines, and of topsoil piles and berms, shall be completed within 30 days following completion of construction. Any such area on which construction is completed prior to December 1 shall be seeded during the remainder of the early winter season instead of during the following spring, unless BLM approves otherwise based on weather. If road or pipeline construction occurs discontinuously (e.g., new segments installed as new pads are built) or continuously but with a total duration greater than 30 days, reclamation, including seeding, shall be phased such that no portion of the temporarily disturbed area remains in an unreclaimed condition for longer than 30 days. BLM may authorize deviation from this requirement based on the season and the amount of work remaining on the entirety of the road or pipeline when the 30-day period has expired.

If requested by the project lead NRS for a specific pad or group of pads, the operator shall contact the NRS by telephone or email approximately 72 hours before reclamation and reseeding begin. This will allow the NRS to schedule a pre-reclamation field visit if needed to ensure that all parties are in agreement and provide time for adjustments to the plan before work is initiated.

The deadlines for seeding described above are subject to extension upon approval of the BLM based on season, timing limitations, or other constraints on a case-by-case basis. If the BLM approves an extension for seeding, the operator may be required to stabilize the reclaimed surfaces using hydromulch, erosion matting, or other method until seeding is implemented.

- c. Topsoil Stripping, Storage, and Replacement. All topsoil shall be stripped following removal of vegetation during construction of well pads, pipelines, roads, or other surface facilities. In areas of thin soil, a minimum of the upper 6 inches of surficial material shall be stripped. The BLM may specify a stripping depth during the onsite visit or based on subsequent information regarding soil thickness and suitability. The stripped topsoil shall be stored separately from subsoil or other excavated material and replaced prior to final seedbed preparation. The BLM best management practice (BMP) for the Windrowing of Topsoil (COA number 19) shall be implemented for well pad construction whenever topography allows.
- d. Seedbed Preparation. For cut-and-fill slopes, initial seedbed preparation shall consist of backfilling and recontouring to achieve the configuration specified in the reclamation plan. For compacted areas, initial seedbed preparation shall include ripping to a minimum depth of 18 inches, with a maximum furrow spacing of 2 feet. Where practicable, ripping shall be conducted in two passes at perpendicular directions. Following final contouring, the backfilled or ripped surfaces shall be covered evenly with topsoil.

Final seedbed preparation shall consist of scarifying (raking or harrowing) the spread topsoil prior to seeding. If more than one season has elapsed between final seedbed preparation and seeding, and if the area is to be broadcast-seeded or hydroseeded, this step shall be repeated no more than 1 day prior to seeding to break up any crust that has formed.

Seedbed preparation is not required for topsoil storage piles or other areas of temporary seeding.

Requests for use of soil amendments, including basic product information, shall be submitted to the BLM for approval.

- e. Seed Mixes. A seed mix consistent with BLM standards in terms of species and seeding rate for the specific habitat type shall be used on all BLM lands affected by the project (see Attachments 1 and 2 of the letter provided to operators dated May 1, 2008). Note that temporary seeding no longer allows the use of sterile hybrid non-native species.

For private surfaces, the menu-based seed mixes are recommended, but the surface landowner has ultimate authority over the seed mix to be used in reclamation. The seed shall contain no noxious, prohibited, or restricted weed seeds and shall contain no more than 0.5 percent by weight of other weed seeds. Seed may contain up to 2.0 percent of "other crop" seed by weight, including the seed of other agronomic crops and native plants; however, a lower percentage of other crop seed is recommended. Seed tags or other official documentation shall be submitted to BLM at least 14 days before the date of proposed seeding for acceptance. Seed that does not meet the above criteria shall not be applied to public lands.

- f. Seeding Procedures. Seeding shall be conducted no more than 24 hours following completion of final seedbed preparation.

Where practicable, seed shall be installed by drill-seeding to a depth of 0.25 to 0.5 inch. Where drill-seeding is impracticable, seed may be installed by broadcast-seeding at twice the drill-seeding rate, followed by raking or harrowing to provide 0.25 to 0.5 inch of soil cover or by hydroseeding and hydromulching. Hydroseeding and hydromulching shall be conducted in two separate applications to ensure adequate contact of seeds with the soil.

If interim revegetation is unsuccessful, the operator shall implement subsequent reseeding until interim reclamation standards are met.

- g. Mulch. Mulch shall be applied within 24 hours following completion of seeding. Mulch may consist of either hydromulch or of certified weed-free straw or certified weed-free native grass hay crimped into the soil.

NOTE: Mulch is not required in areas where erosion potential mandates use of a biodegradable erosion-control blanket (straw matting).

- h. Erosion Control. Cut-and-fill slopes shall be protected against erosion with the use of water bars, lateral furrows, or other measures approved by the BLM. Cut-and-fill slopes along drainages or in areas with high erosion potential shall also be protected from erosion using hydromulch designed specifically for erosion control or biodegradable blankets/matting, bales, or wattles of weed-free straw or weed-free native grass hay. A well-anchored fabric silt fence shall also be placed at the toe of cut-and-fill slopes along drainages or to protect other sensitive areas from deposition of soils eroded off the slopes. Additional BMPs shall be employed as necessary to reduce soil erosion and offsite transport of sediments.
- i. Site Protection. The pad shall be fenced to BLM standards to exclude livestock grazing for the first two growing seasons or until seeded species are firmly established, whichever comes later. The seeded species will be considered firmly established when at least 50 percent of the new plants are producing seed. The BLM will approve the type of fencing.
- j. Monitoring. The operator shall conduct annual monitoring surveys of all sites categorized as “operator reclamation in progress” and shall submit an annual monitoring report of these sites to the BLM by **December 31** of each year. The monitoring program shall use the four Reclamation Categories defined in Appendix I of the 1998 DSEIS to assess progress toward reclamation objectives. The annual report shall document whether attainment of reclamation objectives appears likely. If one or more objectives appear unlikely to be achieved, the report shall identify appropriate corrective actions. Upon review and approval of the report by the BLM, the operator shall be responsible for implementing the corrective actions or other measures specified by the BLM.
8. Weed Control. The operator shall regularly monitor and promptly control noxious weeds or other undesirable plant species as set forth in the Glenwood Springs Field Office *Noxious and Invasive Weed Management Plan for Oil and Gas Operators*, dated March 2007. A Pesticide Use Proposal (PUP) must be approved by the BLM prior to the use of herbicides. Annual weed monitoring reports shall be submitted to BLM by **December 1**.
9. Big Game Winter Range Timing Limitation. To minimize impacts to wintering big game, no construction, drilling or completion activities shall occur during a Timing Limitation (TL) period from **January 16 to April 29** for leases COC51440, COC50126, and COC46972 and from **December 1 to April 30** for lease COC66718.
10. Bald and Golden Eagles. It shall be the responsibility of the operator to comply with the Bald and Golden Eagle Protection Act (Eagle Act) with respect to “take” of either eagle species. Under the Eagle Act, “take” includes to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest and disturb. “Disturb” means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior. Avoidance of eagle nest sites, particularly during the nesting season, is the primary and preferred method to avoid a take. Any oil or gas construction, drilling, or completion activities

planned within 0.5 mile of a bald or golden eagle nest, or other associated activities greater than 0.5 miles from a nest that may disturb eagles, should be coordinated with the BLM project lead and BLM wildlife biologist and the USFWS representative to the BLM Field Office (970-876-9051).

11. Raptor Nesting. Raptor nest surveys in the project vicinity resulted in the location of one or more raptor nest structures within 0.25 mile of a well pad or 0.125 mile of an access road, pipeline, or other surface facility. To protect nesting raptors, a 60-day TL shall be applied to construction, drilling, or completion activities within the buffer widths specified above, if the activities would be initiated during the nesting period of **April 1 through May 31**. An exception to this TL may be granted for any year in which a subsequent survey determines one of the following: (a) the nest is in a severely dilapidated condition or has been destroyed due to natural causes, (b) the nest is not occupied during the normal nesting period for that species, (c) the nest was occupied but subsequently failed due to natural causes, or (d) the nest was occupied, but the nestlings have fledged and dispersed from the nest. If project-related activities are initiated within the specified buffer distance of any active nest, even if outside the 60-day TL period, the operator remains responsible for compliance with the MBTA with respect to a “take” of birds or of active nests (those containing eggs or young), including nest failure caused by human activity (see COA for Migratory Birds).
12. Birds of Conservation Concern. Pursuant to BLM Instruction Memorandum 2008-050, all surface-disturbing activities are prohibited from **May 1 to June 30** to reduce impacts to Birds of Conservation Concern (BCC). An exception to this TL will be granted if nesting surveys conducted no more than one week prior to surface-disturbing activities indicate that no BCC species are nesting within 30 meters (100 feet) of the area to be disturbed. Nesting shall be deemed to be occurring if a territorial (singing) male is present within the distance specified above. Nesting surveys shall include an aural survey for diagnostic vocalizations in conjunction with a visual survey for adults and nests. Surveys shall be conducted by a qualified breeding bird surveyor between sunrise and 10:00 AM under favorable conditions for detecting and identifying a BCC species. This provision does not apply to ongoing construction, drilling, or completion activities that are initiated prior to May 1 and continue into the 60-day period at the same location.
13. Migratory Birds. It shall be the responsibility of the operator to comply with the Migratory Bird Treaty Act (MBTA) with respect to “take” of migratory bird species. Under the MBTA, “take” means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The operator shall prevent use by migratory birds of any pit containing fluids associated with oil or gas operations, including but not limited to reserve pits, produced-water pits, hydraulic fracturing flowback pits, cuttings trenches (if covered by water or other fluid), and evaporation pits. Liquids in these pits may pose a risk to migratory birds (e.g., waterfowl, shorebirds, wading birds, songbirds, and raptors) as a result of ingestion, absorption through the skin, or interference with buoyancy and temperature regulation. Regardless of the method used, it shall be in place within 24 hours following the placement of fluids into a pit. Because of high toxicity to birds, oil slicks and oil sheens should immediately be skimmed off the surface of any pit that is not netted. The most effective way to eliminate risk to migratory birds is prompt drainage, closure, and reclamation of pits, which is strongly encouraged. All mortality or injury to species protected by the MBTA shall be reported immediately to the BLM project lead and to the USFWS representative to the BLM Field Office at 970-876-9051 and visit <http://www.fws.gov/mountain-prairie/contaminants/oilpits.htm>.
14. Range Management. Range improvements (fences, gates, reservoirs, pipelines, etc.) shall be avoided during development of natural gas resources to the maximum extent possible. If range improvements are damaged during exploration and development, the operator will be responsible for repairing or replacing the damaged range improvements. If a new or improved access road bisects an existing

livestock fence, steel frame gate(s) or a cattleguard with associated bypass gate shall be installed across the roadway to control grazing livestock.

15. Ips Beetle. To avoid mortality of pinyon pines due to infestations of the *Ips* beetle, any pinyon trees damaged during road, pad, or pipeline construction shall be chipped after being severed from the stump or grubbed from the ground, buried in the toe of fill slopes (if feasible), or cut and removed from the site within 24 hours to a location approved by the Colorado State Forest Service.
16. Paleontological Resources. All persons associated with operations under this authorization shall be informed that any objects or sites of paleontological or scientific value, such as vertebrate or scientifically important invertebrate fossils, shall not be damaged, destroyed, removed, moved, or disturbed. If in connection with operations under this authorization any of the above resources are encountered the operator shall immediately suspend all activities in the immediate vicinity of the discovery that might further disturb such materials and notify the BLM of the findings. The discovery must be protected until notified to proceed by the BLM.

Where feasible, the operator shall suspend ground-disturbing activities at the discovery site and immediately notify the BLM of any finds. The BLM will, as soon as feasible, have a BLM-permitted paleontologist check out the find and record and collect it if warranted. If ground-disturbing activities cannot be immediately suspended, the operator shall work around or set the discovery aside in a safe place to be accessed by the BLM-permitted paleontologist.

17. Cultural Education/Discovery. All persons in the area who are associated with this project shall be informed that if anyone is found disturbing historic, archaeological, or scientific resources, including collecting artifacts, the person or persons will be subject to prosecution.

Pursuant to 43 CFR 10.4(g), the BLM shall 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 43 CFR 10.4 (c) and (d), activities shall stop in the vicinity of the discovery, and the discovery shall be protected for 30 days or until notified by the BLM to proceed.

If in connection with operations under this contract, the operator, its contractors, their subcontractors, or the employees of any of them discovers, encounters, or becomes aware of any objects or sites of cultural value or scientific interest such as historic ruins or prehistoric ruins, graves or grave markers, fossils, or artifacts, the operator shall immediately suspend all operations in the vicinity of the cultural resource and shall notify the BLM of the findings (16 USC 470h-3, 36 CFR 800.112). Operations may resume at the discovery site upon receipt of written instructions and authorization by the BLM. Approval to proceed will be based upon evaluation of the resource. Evaluation shall be by a qualified professional selected by the BLM from a Federal agency insofar as practicable. When not practicable, the operator shall bear the cost of the services of a non-Federal professional.

Within five working days, the BLM will inform the operator as to:

- whether the materials appear eligible for the National Register of Historic Places
- what mitigation measures the holder will likely have to undertake before the site can be used (assuming that *in-situ* preservation is not necessary)

- the timeframe for the BLM to complete an expedited review under 36 CFR 800.11, or any agreements in lieu thereof, to confirm through the SHPO State Historic Preservation Officer that the findings of the BLM are correct and that mitigation is appropriate

The operator may relocate activities to avoid the expense of mitigation and 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 operator shall be responsible for mitigation costs. The BLM will provide technical and procedural guidelines for relocation and/or to conduct mitigation. Upon verification from the BLM that the required mitigation has been completed, the operator will be allowed to resume construction.

Antiquities, historic ruins, prehistoric ruins, and other cultural or paleontological objects of scientific interest that are outside the authorization boundaries but potentially affected, either directly or indirectly, by the Proposed Action shall also be included in this evaluation or mitigation. Impacts that occur to such resources as a result of the authorized activities shall be mitigated at the operator's cost, including the cost of consultation with Native American groups.

Any person who, without a permit, injures, destroys, excavates, appropriates or removes any historic or prehistoric ruin, artifact, object of antiquity, Native American remains, Native American cultural item, or archaeological resources on public lands is subject to arrest and penalty of law (16 USC 433, 16 USC 470, 18 USC 641, 18 USC 1170, and 18 USC 1361).

18. Visual Resources. All applications for permit to drill (APDs) shall include a detailed, site-specific description outlining how the Proposed Action will meet the VRM Class of the area where the action is proposed. The specific location of the Proposed Action, including pads, roads, and pipelines, shall be shown on a map and shall include associated cut-and-fill data (location, horizontal and vertical extent, slope length, and steepness).

Production facilities shall be placed to avoid or minimize visibility from travel corridors, residential areas, and other sensitive observation points—unless directed otherwise by the BLM due to other resource concerns—and shall be placed to maximize reshaping of cut-and-fill slopes and interim reclamation of the pad.

To the extent practical, existing vegetation shall be preserved when clearing and grading for pads, roads, and pipelines. The BLM may direct that cleared trees and rocks be salvaged and redistributed over reshaped cut-and-fill slopes or along linear features.

Above-ground facilities shall be painted **Shadow Gray**.

During construction, BLM and Bill Barrett representatives shall jointly review construction measures to determine effectiveness in meeting visual resource mitigation measures, and if subtle changes in construction techniques are warranted.

After construction, the road alignments shall be reviewed to determine if the road surface color is dominate in the viewshed (as viewed from the KOPs). If it is determined that the road surface color contrasts with the surrounding landscape, dust abatement measures with Magnesium Chloride or other dust abatement measure, as approved by the BLM authorized officer, shall be required. The operator shall implement a regularly scheduled dust abatement application so that the road surface takes on and maintains a dark appearance when the road is viewed from the KOPs. The level and type of treatment may be changed in intensity and must be approved by the BLM authorized officer.

Magnesium chloride or other chemical suppressant shall not be applied within 100 feet of any drainage.

19. Windrowing of Topsoil. Topsoil shall be windrowed around the pad perimeter to create a berm that limits and redirects stormwater runoff and extends the viability of the topsoil per BLM Topsoil Best Management Practices (BLM 2009 PowerPoint presentation available upon request from Glenwood Springs Field Office). Topsoil shall also be windrowed, segregated, and stored along pipelines and roads for later spreading across the disturbed corridor during final reclamation. Topsoil berms shall be promptly seeded to maintain soil microbial activity, reduce erosion, and minimize weed establishment.
20. Reserve Pit. A minimum of 2 feet of freeboard shall be maintained in the reserve pit. Freeboard is measured from the highest level of drilling fluids and cuttings in the reserve pit to the lowest surface elevation of ground at the reserve pit perimeter.
21. Soils. Cuts and fills shall be minimized when working on erosive soils and slopes in excess of 30 percent. Cut-and-fill slopes shall be stabilized through revegetation practices with an approved seed mix shortly following construction activities to minimize the potential for slope failures and excessive erosion. Fill slopes adjacent to drainages shall be protected with well-anchored silt fences, straw wattles, or other acceptable BMPs designed to minimize the potential for sediment transport. On slopes greater than 50 percent, BLM personnel may request a professional geotechnical analysis prior to construction.
22. Requirement for Geotechnical Consultant Oversight. Prior to commencing any surface disturbing activities, a qualified geotechnical engineer licensed in the State of Colorado shall prepare a site evaluation and analysis in at risk areas showing evidence of slope instability (e.g., past mass movement or slumping soils, high soil moisture content present in undisturbed soils, presence of springs or seeps), for cut and fill slopes in excess of 30 feet in height, and cut of fill slope angles steeper than the requirements in the BLM Gold Book 2007 (3:1 in erosive soil, 1:1 common soils, 0.5:1 conglomerate, 0.25:1 solid rock) as determined by the BLM.

During the construction of the pad/and or road sections in areas at risk of slope instability or environmentally sensitive areas a qualified independent construction inspector or civil/geotechnical engineer shall be onsite during all phases of construction in the at risk areas and as determined by the BLM. The inspector/ engineer shall confirm the pad and/or road sections are built to specification in the design package including, but not limited to cut and full slope staking, disturbance limits staking, excavation and embankment placement, slope compaction, slope retention devices, slope benching, at grade and subgrade drainages stormwater control measures etc. Inspection reports prepared by the construction inspector or onsite engineer will be submitted to the BLM Authorized Officer.

SITE-SPECIFIC COAS APPLICABLE TO PADS WITHIN THE GIBSON GULCH II MDP AREA

The following site-specific surface use COAs are in addition to the standard COAs applicable to all wells within the Gibson Gulch II MDP Area and all stipulations attached to the respective Federal leases.

MDP 21 Pad and MDP 22 Pad

1. Requirement for Archaeological Monitor. Due to cultural resources in the pipeline vicinity, an archaeological monitor will be required to be on site prior to commencing any surface disturbing activities on the pipeline section between the proposed MDP 21 and MDP 22 well pad locations.

The monitor shall be provided by an archaeological firm qualified and permitted to do such archaeological work within the CRVFO area.

- Prior to any ground-disturbing activities, a cultural resource barricade/safety fence shall be installed along the southern extent of the pipeline ROW between the proposed MDP 21 and MDP 22 well pad locations for a distance of approximately 325 meters per BLM archaeologist's instructions.
- No ground-disturbing construction activities (topsoiling, grading, ditching, etc.) shall begin prior to the archaeologist's arrival. The proponent is responsible for notifying the archaeological firm at least 72 hours in advance any ground disturbance in the specified areas. The proponent is responsible for all construction delays and or damage to cultural manifestations due to insufficient notification of the Archaeological Contractor, noncompliance with the following procedures, or damage to cultural manifestations.
- Archaeological monitoring shall involve on the ground visual inspection of all construction for the pipeline within the above specified area. The archaeologist shall follow all the ground disturbing equipment at a cautionary distance, allowing time for the construction dust to settle and for visible detection of buried cultural features to occur. All ground disturbing activities in the vicinity of identified feature(s) shall be halted and a buffer area at least 100 feet from the identified feature(s) shall be protected from any additional disturbance until which time as the feature(s) are mitigated via data recovery. Appropriate samples for analyses to determine cultural/temporal affiliation, subsistence, at least one stratigraphic profile shall be made for each feature identified, and paleoenvironmental reconstructions shall be taken as appropriate. Periodic reporting to the BLM archaeologist of progress and findings shall be completed on a schedule as determined by the BLM authorized officer.
- Archaeological monitoring shall also include observing personnel and equipment activity to make sure personnel and ground disturbance does not stray beyond cultural resource barricade/safety fencing.
- Once all ground disturbing activity is complete the archaeological contractor shall produce and submit one draft written report. Upon acceptance of the report two reports shall be submitted, one for the BLM and one for the SHPO. This report must be in a contextual framework that is compatible with known archaeological knowledge of the area and the Northern Colorado River Basin Context.

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DOWNHOLE CONDITIONS OF APPROVAL

Applications for Permit to Drill

Company/Operator: Bill Barrett Corporation

Surface Location: SESW, Section 33, Township 6 South, Range 91 West, 6th P.M.

<u>Well Name</u>	<u>Well Number</u>	<u>Pad Name</u>	<u>Bottomhole Location</u>	<u>Lease</u>
Federal	23A-33-691	MDP 25	NESW, Sec. 33, T6S, R91W	COC51440
Federal	23B-33-691	MDP 25	NESW, Sec. 33, T6S, R91W	COC51440
Federal	23C-33-691	MDP 25	NESW, Sec. 33, T6S, R91W	COC51440
Federal	23D-33-691	MDP 25	NESW, Sec. 33, T6S, R91W	COC51440
Federal	24A-33-691	MDP 25	SESW, Sec. 33, T6S, R91W	COC51440
Federal	24B-33-691	MDP 25	SESW, Sec. 33, T6S, R91W	COC51440
Federal	24C-33-691	MDP 25	SESW, Sec. 33, T6S, R91W	COC51440
Federal	24D-33-691	MDP 25	SESW, Sec. 33, T6S, R91W	COC51440
Federal	33A-33-691	MDP 25	NWSE, Sec. 33, T6S, R91W	COC51440
Federal	33B-33-691	MDP 25	NWSE, Sec. 33, T6S, R91W	COC51440
Federal	33C-33-691	MDP 25	NWSE, Sec. 33, T6S, R91W	COC51440
Federal	33D-33-691	MDP 25	NWSE, Sec. 33, T6S, R91W	COC51440
Federal	34A-33-691	MDP 25	SWSE, Sec. 33, T6S, R91W	COC51440
Federal	34B-33-691	MDP 25	SWSE, Sec. 33, T6S, R91W	COC51440
Federal	34C-33-691	MDP 25	SWSE, Sec. 33, T6S, R91W	COC51440
Federal	34D-33-691	MDP 25	SWSE, Sec. 33, T6S, R91W	COC51440
Well Name	Well No./Pad		Bottomhole Location	Lease
Federal	13A-34-691	MDP 26	NWSW, Sec. 34, T6S, R91W	COC66718
Federal	13B-34-691	MDP 26	NWSW, Sec. 34, T6S, R91W	COC66718
Federal	13C-34-691	MDP 26	NWSW, Sec. 34, T6S, R91W	COC66718
Federal	13D-34-691	MDP 26	NWSW, Sec. 34, T6S, R91W	COC66718
Federal	14A-34-691	MDP 26	SWSW, Sec. 34, T6S, R91W	COC66718
Federal	14B-34-691	MDP 26	SWSW, Sec. 34, T6S, R91W	COC66718
Federal	14C-34-691	MDP 26	SWSW, Sec. 34, T6S, R91W	COC66718
Federal	14D-34-691	MDP 26	SWSW, Sec. 34, T6S, R91W	COC66718
Federal	43A-33-691	MDP 26	NESE, Sec. 33, T6S, R91W	COC66718
Federal	43B-33-691	MDP 26	NESE, Sec. 33, T6S, R91W	COC66718
Federal	43C-33-691	MDP 26	NESE, Sec. 33, T6S, R91W	COC66718
Federal	43D-33-691	MDP 26	NESE, Sec. 33, T6S, R91W	COC66718
Federal	44A-33-691	MDP 26	SESE, Sec. 33, T6S, R91W	COC66718
Federal	44B-33-691	MDP 26	SESE, Sec. 33, T6S, R91W	COC66718
Federal	44C-33-691	MDP 26	SESE, Sec. 33, T6S, R91W	COC66718
Federal	44D-33-691	MDP 26	SESE, Sec. 33, T6S, R91W	COC66718

1. Twenty-four hours *prior* to (a) spudding, (b) conducting BOPE tests, (c) cementing/running casing strings, and (d) within twenty-four hours *after* spudding, the CRVFO shall be notified. One of the following CRVFO inspectors shall be notified by phone. The contact number for all notifications is 970-876-9064. The BLM CRVFO inspectors are Julie King, Lead PET; David Giboo, PET; Greg Rios, PET; and Alan White, PET.
2. A CRVFO petroleum engineer shall be contacted for a verbal approval prior to commencing remedial work, plugging operations on newly drilled boreholes, changes within the drilling plan, sidetracks, changes or variances to the BOPE, deviating from conditions of approval, and conducting other operations not specified within the APD. Contact, Bob Hartman at 970-244-3041 or a CRVFO petroleum engineer at 970-876-9049 (office) or 970-319-5837 (cell) for verbal approvals.
3. If a well control issue (e.g. kick, blowout, water flow, casing failure, or bradenhead pressure increase) arises during drilling or completions operations, Bob Hartman (970-244-3041) or a CRVFO petroleum engineer at 970-876-9049 (office) or 970-319-5837 (cell) shall be notified for verbal approvals within 24 hours from the time of the event. IADC/Driller's Logs and Pason Logs (mud logs) shall be forwarded to CRVFO, Petroleum Engineer, 2300 River Frontage Road, Silt, CO 81652 within 24 hours of a well control event.
4. The BOPE shall be tested and conform to Onshore Order #2 for a **5M** system and recorded in the IADC/Driller's log. A casing head rated to 5,000 psi or greater shall be utilized.
5. Flexible choke lines shall meet or exceed the API SPEC 16C requirements. Flexible choke lines shall be effectively anchored, have flanged connections, and configured to the manufacturer's specifications. Manufacturer specifications shall be kept with the drilling rig at all times and immediately supplied to the authorized officer/inspector upon request. Specifications, at a minimum, shall include acceptable bend radius, heat range, anchoring, and the working pressure. All flexible choke lines shall be free of gouges, deformation, and as straight/short as possible.
6. Prior to drilling out the surface casing shoe, an electrical/mechanical mud monitoring equipment shall be function tested. As a minimum, this equipment shall include a trip tank or equivalent calibrated mud tank, pit volume totalizer, stroke counter, and flow sensor.
7. Prior to drilling out the surface casing shoe, gas detecting equipment shall be installed in the mud return system. The mud system shall be monitored for hydrocarbon gas/pore pressure changes, rate of penetration, and fluid gain/loss.
8. Prior to drilling out the surface casing shoe, a gas buster shall be functional and all flare lines effectively anchored in place. The panic line shall be a separate line (not open inside the buffer tank) and effectively anchored. All lines shall be downwind of the prevailing wind direction and directed into a flare pit, which cannot be the reserve pit. The flare system shall use an automatic ignition source. Where noncombustible gas is likely or expected to be vented, the system shall be provided supplemental fuel for ignition and maintain a continuous flare.
9. 800 feet of Surface Casing shall be installed on these wells to protect potential water source/aquifers and control loss circulation zones.
10. Air drilling shall conform to all OOGO No. 2 requirements. A rotating head is required for air drilling operations.
11. After the surface/intermediate casing is cemented, a Pressure Integrity Test/Mud Equivalency

Test/FIT shall be performed on the first well drilled in accordance with OOGO No. 2; Sec. III, B.1.i. to ensure that the surface casing is set in a competent formation. This is not a Leak-off Test, but a formation competency test, ensuring the formation at the shoe is tested to the minimum mud weight equivalent anticipated to control the formation pressure to the next casing shoe depth or TD. Submit the results from the test via email (bhartman@blm.gov) on the first well drilled on the pad and record results in the IADC log.

12. As a minimum, cement shall be brought to 200 feet above the Mesaverde. After WOC for the production casing, a CBL shall be run to verify the TOC and an electronic copy in .las and .pdf format shall be submitted to CRVFO, 2300 River Frontage Road, Silt, CO 81652 within 48 hours. If the TOC is lower than required or the cement sheath of poor quality, then within 48 hours from running the CBL and prior to commencing fracturing operations, a CRVFO petroleum engineer shall be notified at 970-876-9049 (office) or 970-319-5837 (cell) for remedial operations. Please evaluate the top of cement on the first cement job on the pad (Temperature Log).
13. On the first well drilled on this pad, a triple combo open-hole log shall be run from the base of the surface borehole to surface, and from TD to bottom of surface casing shoe. This log shall be in submitted within 48 hours in .las and .pdf format to CRVFO, Todd Sieber, 2300 River Frontage Road, Silt, CO 81652. Contact Todd Sieber at 970-876-9063 or asieber@blm.gov for clarification.
14. Submit the (a) mud/drilling log (e.g. Pason disc), (b) driller's event log/operations summary report, (c) directional survey, and (d) Pressure Integrity Test results within 30 days of cementing the production casing per 43 CRF 3160-9.
15. During hydraulic frac operations, monitor the bradenhead/casing head pressures throughout the frac job. Any sharp rise in annular pressure (+/- 40 psi or greater) shall terminate the frac operations in order to determine well/wellbore integrity. Notify a CRVFO engineer/inspector of annular pressure increase.
16. Prior to commencing fracturing operations, the production casing shall be tested to the maximum anticipated surface treating/fracture pressure and held for 15 minutes without a 2% leak-off. If leak-off is found, CRVFO petroleum engineer shall be notified within 24 hours of the failed test, but prior to proceeding with fracturing operations. The test shall be charted and set to a time increment as to take up no less than a quarter of the chart per test. The chart shall be submitted with Form 3160-4, Well Completion Report.
17. Submit a monthly report of operations or production per 43 CFR 3162.4-3 including any production from these wells in MCFPD, BOPD, BWPD with FTP/SITP until the completion report (Form 3160-4) is filed.
18. Per CFR 3162.4-1(c), not later than the 5th business day after any well begins production on which royalty is due anywhere on a lease site or allocated to a lease site, or resumes production in a case of a well which has been off production for more than 90 days, the operator shall notify the authorized officer by letter or sundry notice, Form 3160-5, or orally to be followed by a letter or sundry notice, of the date on which such production has begun or resumed.

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STIPULATIONS SPECIFIC TO RIGHTS-OF-WAY

General:

A copy of these stipulations, including exhibits and the Plan(s) of Operation (if required), shall be onsite at the project area and available to persons directing equipment operation.

1. Notification to BLM. The holder shall notify the BLM at least 48 hours prior to initiation of construction. If requested by the AO, the holder shall schedule a pre-construction meeting, including key holder and contractor personnel, to ensure that any unresolved issues are fully addressed prior to initiation of surface-disturbing activities or placement of production facilities.
2. Utility Locates. All existing pipelines, surface valves, and other utilities shall be field located, clearly marked, and the appropriate Utility Notification Center (www.unc.org) shall be notified before any construction/surface work occurs. All publicly owned underground facilities shall be marked according to the APWA color code.
3. Indemnification. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. 9601 *et seq.* or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, *et seq.*) on the ROW (unless the release or threatened release is wholly unrelated to the holder's activity in the ROW). This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.
4. Compliance with Laws. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976, as amended (15 U.S.C. 2601 *et seq.*) with regard to any toxic substances that are used, generated by, or stored on the ROW or on facilities authorized under this ROW grant (see 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193). Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, Section 102b. A copy of any report required or requested by any Federal agency or state government as a result of a reportable release of spill of any toxic substances shall be furnished to the Authorized Officer concurrent with the filing of the reports to the involved Federal agency or state government.

This grant is issued subject to the holder's compliance with all applicable regulations contained in **Title 43 Code of Federal Regulations part 2800.**

5. Saturated Soil. When saturated soil conditions exist on or along the ROW any type of construction shall be halted until soil material dries out or is frozen sufficiently for construction to proceed without undue damage and erosion to soils.
6. Dust Abatement. The holder shall be responsible for applying dust abatement measures as needed or as directed by the Authorized Officer to reduce the emissions of fugitive dust from access roads. The level and type of treatment (watering or application of various dust agents, surfactants and road surfacing material) may be changed in intensity and must be approved by the Authorized Officer. Dust control is needed to prevent heavy plumes of dust from road use that create safety problems and disperses heavy amounts of particulate matter on adjacent vegetation.

Speed control measures on all project-related unpaved roads shall be implemented to reduce vehicle fugitive dust.

7. Waste. The holder shall promptly remove and dispose of all waste, caused by its activities. The term "waste" as used herein means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, petroleum products, ashes, and equipment. No burning of trash, trees, brush, or any other material shall be allowed. Disposal of all liquid and solid waste produced during operation of this right-of-way shall be in an approved manner to ensure that it does not impact the air, soil, water, vegetation, or animals.
8. Noxious Weeds. The holder shall regularly monitor and promptly control noxious weeds or other undesirable plant species as set forth in the "Glenwood Springs Energy Office Noxious and Invasive Weed Management Plan for Oil and Gas Holders," dated March 2007. A Pesticide Use Proposal (PUP) must be approved by the BLM prior to the use of herbicides. Annual weed monitoring reports shall be submitted by December 31.
9. Visual Resources. All above ground structures not subject to safety requirements shall be painted by holder to the specifications of the AO.
10. Notification to other ROW Holders. The holder shall notify all existing ROW holders in the project area prior to beginning any surface disturbance or construction activities. It is the holder's responsibility to coordinate with all other ROW holders and resolve any conflicts.
11. Range Management. Range improvements (fences, gates, reservoirs, pipelines, etc.) shall be avoided during development of natural gas resources to the maximum extent possible. If range improvements are damaged during exploration and development, the holder will be responsible for repairing or replacing the damaged range improvements. If a new or improved access road bisects an existing livestock fence, steel frame gate(s) or a cattleguard with associated bypass gate shall be installed across the roadway to control grazing livestock.
12. As-Built Survey. An "as-built" center line survey of the right-of-way crossing Federal land, provided by a Certified Land Surveyor licensed to work in the State of Colorado, shall be provided to the AO within 2 months of completion of the project.
13. Applicable Permits. This authorization is contingent upon receipt of and compliance with all appropriate Federal, state, county and local, permits. The holder shall be responsible for obtaining all necessary environmental clearances and permits from all agencies (U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. Forest Service, Colorado Department of Transportation, Colorado Parks and Wildlife, Colorado Department of Health and Environment, County Health Department, etc.) before commencing any work under this permit. Without all clearances and permits, this permit shall be not in effect. Holder shall assume all responsibility and liability related to potential environmental hazards encountered in connection with work under this permit.
14. Cultural Education/Discovery. All persons in the area who are associated with this project must be informed that if anyone is found disturbing historic, archaeological, or scientific resources, including collecting artifacts, the person or persons will be subject to prosecution.

Pursuant to 43 CFR 10.4(g), the BLM shall 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 43 CFR 10.4 (c) and (d), activities shall stop in the vicinity

of the discovery, and the discovery shall be protected for 30 days or until notified by the BLM AO to proceed.

15. Reclamation. Reclamation goals, objectives, timelines, measures, and monitoring methods for final reclamation of oil and gas disturbances are described in Appendix I (Surface Reclamation) of the 1998 Draft Supplemental EIS (DSEIS). The specific measures described below shall be followed during interim reclamation of disturbed surfaces associated with well pads, access roads, and pipelines.
16. Winter Range Timing Limitation. **January 16 – April 29** for COC50126, COC46982, and COC51440 and **December 1 – April 30** for COC66718
17. Survey Monuments. All survey monuments, witness corners, and/or reference monuments must be protected against destruction, obliteration, removal, or damage. Any damaged or obliterated markers must be reestablished in accordance with accepted survey practices at the expense of the holder.
18. Maintenance Agreement. The holder shall obtain a Maintenance Agreement with any existing rights-of-way holders prior to any disturbance or construction of pipeline across or adjacent to any existing right-of-way. A copy of the signed Agreement shall be forwarded to the Glenwood Springs Energy Office within 30 days of the execution of the grant.
19. Traffic Control. Appropriate precautions for traffic control on public lands shall be in place and conform to the guidelines of the “Manual on Uniform Traffic Control Devices (MUTCD): Temporary Traffic Control Elements.” A copy of the traffic control plan shall remain on site at all times during construction activities.
20. Holder shall conduct all activities associated with the construction, operation, and termination of the right-of-way within the authorized limits of the granted right-of-way.

Pipelines:

COMMON CARRIER: Common carrier provisions shall be applied, per **43 CFR 2885.11(b)** construct, operate, and maintain the pipeline as a common carrier. This means that the pipeline owners and holders must accept, convey, transport, or purchase without discrimination all oil or gas delivered to the pipeline without regard to where the oil and gas was produced (*i.e.*, whether on Federal or non-Federal lands).

1. Minimum Depth of Pipelines. All pipelines shall be buried to a depth of 3 feet, except at road crossings where they shall be buried to a depth of 4 feet. The pipeline trench shall be excavated mechanically. Pipe segments shall be welded together and tested, lowered into the trench, and covered with excavated material.
2. Welding of Pipeline. A minimum of 10% of all welds shall be x-rayed. Visual inspections shall be performed on 100% of all pipeline welds. Any pipeline occurring within the Rifle Municipal Watershed Area and/or within 100 feet of any perennial or intermittent stream crossing, shall have all welds x-rayed. Area All bored areas shall have 100% x-rays of all pipeline welds. (*Ref. 49 CFR 192.225 Welding procedures*) All welders shall be appropriately certified. (*Ref. 49 CFR 192.227 Qualification of welders*). (*NOTE: 49 CFR Subpart F—Joining of Materials Other than by Welding (192.281 includes plastic pipe).*)
3. Fire Suppression. Welding or other use of acetylene or other torch with open flame shall be operated in an area barren or cleared of all flammable materials at least 10 feet on all sides of equipment.

Internal combustion engines shall be equipped with approved spark arrestors which meet either (a) the USDA Forest Service Standard 5100-1a or (b) Society of Automotive Engineers (SAE) recommended practices J335(b) and J350(a).

4. Pressure Testing Pipelines: Encana shall ensure that pressure-testing operations are carried out in accordance with the following:
- United States Department of Transportation Code of Federal Regulations (CFR), Title 49, Part 192, Subpart J, entitled “Test Requirements”
 - Environmental Protection Agency
 - Portable compressors for pressure testing shall not be stationed within 100 feet of any residence. All nearby residents as well as the COUNTY Dispatch Center shall be notified at least 24 hours in advance of beginning the pipeline loading process.

The entire pipeline shall be tested in compliance with DOT regulations (49 CFR Part 192). Incremental segments of the pipeline shall be filled to the desired maximum pressure and held for the duration of the test (8 hours minimum). (Ref. 49 CFR 192.503.c)

Notification to all nearby residents as well as the appropriate County Dispatch Center shall be made no less than 24 hours prior to the pressure test and blow down. All necessary and reasonable precautions shall be taken to ensure the safety of the employees and the general public, the lands, domestic animals and wildlife, etc. This may include, but not be limited to, restriction of access to the pipe being tested, temporary warning signs installed in appropriate locations, effective communication.

5. Open Trenches. Open trenches shall be maintained in a safe condition. Trenches adjacent to access roads shall be covered and/or warning barriers erected upon completion of daily construction or at any time personnel are not present on the construction site.
6. Warning Signs. Pipeline warning signs shall be installed within five days of construction completion and prior to use of the pipeline for transportation of product. Pipeline warning signs are required at all road crossings. Signs shall be visible from sign to sign along the R/W. For safety purposes each sign shall be permanently marked with the holder’s name and shall clearly identify the owner (emergency contact) and purpose (product) of the pipeline. (49 CFR 192.707 Line Markers for Mains and Transmission Lines)

(a) Except as provided in paragraph (b) of this section, a line marker must be placed and maintained as close as practical over each buried main and transmission line:

- (1) At each crossing of a public road and railroad; and
- (2) Wherever necessary to identify the location of the transmission line or main to reduce the possibility of damage or interference.

7. Drainage Crossings. Construction activities at perennial, intermittent, and ephemeral drainage crossings (e.g. burying pipelines, installing culverts) shall be timed to avoid high flow conditions. Construction that disturbs any flowing stream shall utilize either a piped stream diversion or a cofferdam and pump to divert flow around the disturbed area.

Culverts at drainage crossings shall be designed and installed to pass a 25-year or greater storm event. On perennial and intermittent streams, culverts shall be designed to allow for passage of aquatic biota. The minimum culvert diameter in any installation for a drainage crossing or road drainage shall be 24 inches. Crossings of drainages deemed to be jurisdictional waters of the U.S. pursuant to Section 404 of the Clean Water Act may require additional culvert design capacity.

8. **Trench Plugs.** Crossings of pipelines beneath or along drainages or wetlands shall be fitted with one or more trench plugs as needed to avoid impacts to the hydrologic regime as a result of lowering of the shallow water table. The shallow zone of permanent or seasonal saturation and/or inundation is critical for maintaining the integrity of wetlands, riparian vegetation, and/or aquatic habitats.

ROADS:

1. **Road Construction and Maintenance.** Roads shall be crowned, ditched, surfaced, drained with culverts and/or water dips, and constructed to BLM Gold Book standards (*Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, The Gold Book, Fourth Edition—Revised 2007, BLM/WO/ST-06/021+3071/REV 07.*). Initial gravel application shall be a minimum of 6 inches. The holder shall provide timely year-round road maintenance and cleanup on the access roads. A regular schedule for maintenance shall include, but not be limited to, blading, ditch and culvert cleaning, road surface replacement, and dust abatement. When rutting within the traveled way becomes greater than 6 inches, blading and/or gravelling shall be conducted as approved by the BLM. All road construction activities shall be supported with a fully implemented stormwater management plan, best management practices and a reclamation/vegetation plan.
2. **Road Construction Staking.** The road centerline shall be flagged and staked prior to the start of surface disturbance within the authorized right-of-way. The edges of the right-of-way shall be established before any work begins.
3. **Road Signage.** Appropriate road signs shall be installed within 5 days of completion of construction. Signs and markers along roadways must meet the requirements of BLM Manual Section 9131 and the

The Federal Highway Administration Manual on Uniform Traffic Control Devices. These signs include information such as speed limits, road curvature, and any information necessary to regulate, inform, or guide vehicle occupants. All signs shall be routinely inspected and maintained on a regular basis to ensure they remain in an appropriate condition to be effective.

4. **Erosion Control.** Cut-and-fill slopes shall be protected against erosion with the use of water bars, lateral furrows, or other measures approved by the BLM. Biodegradable straw matting, bales or wattles of weed-free straw or weed-free native grass hay, or well-anchored fabric silt fence shall be used on cut-and-fill slopes and along drainages to protect against soil erosion. Additional BMPs shall be employed as necessary to reduce erosion and offsite transport of sediment.

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Appendix B
BBC Wildlife Mitigation Plan

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Bill Barrett Corporation Gibson Gulch Unit Wildlife Mitigation Plan

Prepared by:

Derris R Jones
Senior Wildlife Biologist
Environmental Industrial Services

Prepared on behalf of Bill Barrett Corporation for submittal to:

Bureau of Land Management
Colorado River Valley Field Office

July 11, 2011

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I. Background

Oil and gas exploration or development located in or near sensitive wildlife habitat can have impacts to a variety of species. It is well known that big game experience high stress in winter months due to reduced forage and higher caloric needs (White, P.J. *et. al.*, 2010; Peterson, Chris & Messmer, Terry A. 2007).

A variety of impacts can reduce an individual's ability to survive through the winter. Aside from the direct loss of habitat due to the construction of pads and associated roads and pipelines, indirect impacts can distress big game as well. Indirect impacts include noise, traffic, and other human activity associated with the installation and use of oil and gas infrastructure. Timing Limitations (TL) have been applied by the BLM to reduce the amount of seasonal activity in areas that are identified as severe winter range as mapped by the Colorado Division of Wildlife (CPW 2011a). Land managers are limited to original lease stipulations and usually only during the construction and drilling phases and not the production phase. To reduce or mitigate impacts to wildlife requires that both the Bureau of Land Management (BLM) and Bill Barrett Corporation (BBC) to evaluate the proposed development and work together on a course of action that addresses all concerns. It is the goal of this Wildlife Mitigation Plan to offset impacts to wildlife that occur with when the BLM grants an exception to the TL by providing big game food sources and habitat in areas close to their natural winter range.

II. Introduction

The Gibson Gulch Unit Wildlife Mitigation Plan (GGUWMP) was developed for an exception granted by the BLM for a BBC request to drill through a Timing Limitation (TL) for the MDP 9 and MDP 11. This mitigation is planned for the same area currently being evaluated through the GGIIMDP. The MDP 9 and MDP 11 are in Sections 28 and 29 of T6 S, R91 W in Garfield Count Colorado. BBC has agreed to complete the following wildlife habitat enhancement projects as an offset to the TL exception.

III. Project Objective

BBC objectives for the creation and field implementation of the GGUWMP are as follows:

1. Enhance wildlife habitat and forage sources based on sound ecosystem methods and principals for big game and other wildlife living in the area, and,
2. Coordinate with CPW and BLM to offset and mitigate potential wildlife impacts by developing oil and gas while having big game TL waived in order meet BBC commitments.

VI. Project Description and Location

The proposed mitigation is a combination of water developments and vegetation manipulation designed to increase sagebrush for winter forage for big game. An existing pond will be narrowed and deepened. The other water development will be the installation of a guzzler in the north hydro-axe treatment area. The guzzler will be a minimum 1000-gallon capacity with apron design to collect 1000 gallons annually based on average precipitation of 14 inches. Guzzler design will be submitted to BLM for approval prior to installation.

Vegetation treatments will consist of 55 acres of Hydro-ax treatments using a Fecon head attached to a loader or other rubber tired equipment capable of running the Fecon head. The potential for Cheat

grass (*Bromus tectorum*) taking over the site is directly proportional to the amount of dirt disturbance and thus the rubber-tire requirement on equipment.

Fifty acres will be sprayed with the herbicide *Landmark* designed to prevent cheatgrass germination, once in the fall of 2011, and again in the fall of 2012. Application rates will follow label recommendations and BLM regulations. After spraying in 2012 the residual herbaceous vegetation will be evaluated and a determination of the need for native seed application will be beneficial. If it is decided by BLM that seeding would enhance the project, a seed mix approved by the BLM would be drilled in the fall of 2012. It will be important to protect the existing sagebrush stand. Currently the site is an old vegetation treatment that is dominated by sagebrush with an understory of cheat grass that is preventing native grass and forb species from becoming established. There is a fair amount of western wheat in the area but it is prevented from expanding because of the cheat grass competition.

Attached is a map (Figure 1) indicating the location of the pond that is planned to be reconstructed, the location for the guzzler, the north and south area for the Hydro-axe treatment, as well as the herbicide treatment area?

IV. Site Description

Juniper and sagebrush are the two dominate forms of vegetation found within the GGUWMP area. At the lower elevations along the edge of the junipers, the habitat has been converted to irrigated pastures used agriculturally. At the upper elevations, juniper integrates with pinyon and Gambel oak. The composition of juniper stands vary, with some areas containing little understory vegetation, and others containing sagebrush at varying densities. Cheatgrass is invading on most open sites and will create difficulty in seeding, making it important to select sites with good understory for treatment, or necessitate the use of a germination inhibitor. The elevation of the site is approximately 6,000 feet above sea level. The average annual precipitation is between 12 and 14 inches.

V. Sensitive Timing Issues

To minimize disturbance to wildlife populations, treatments would not occur during big game wintering TLs or during migratory bird nesting seasons, including raptors if nests are located within the spatial buffer of the proposed disturbance.

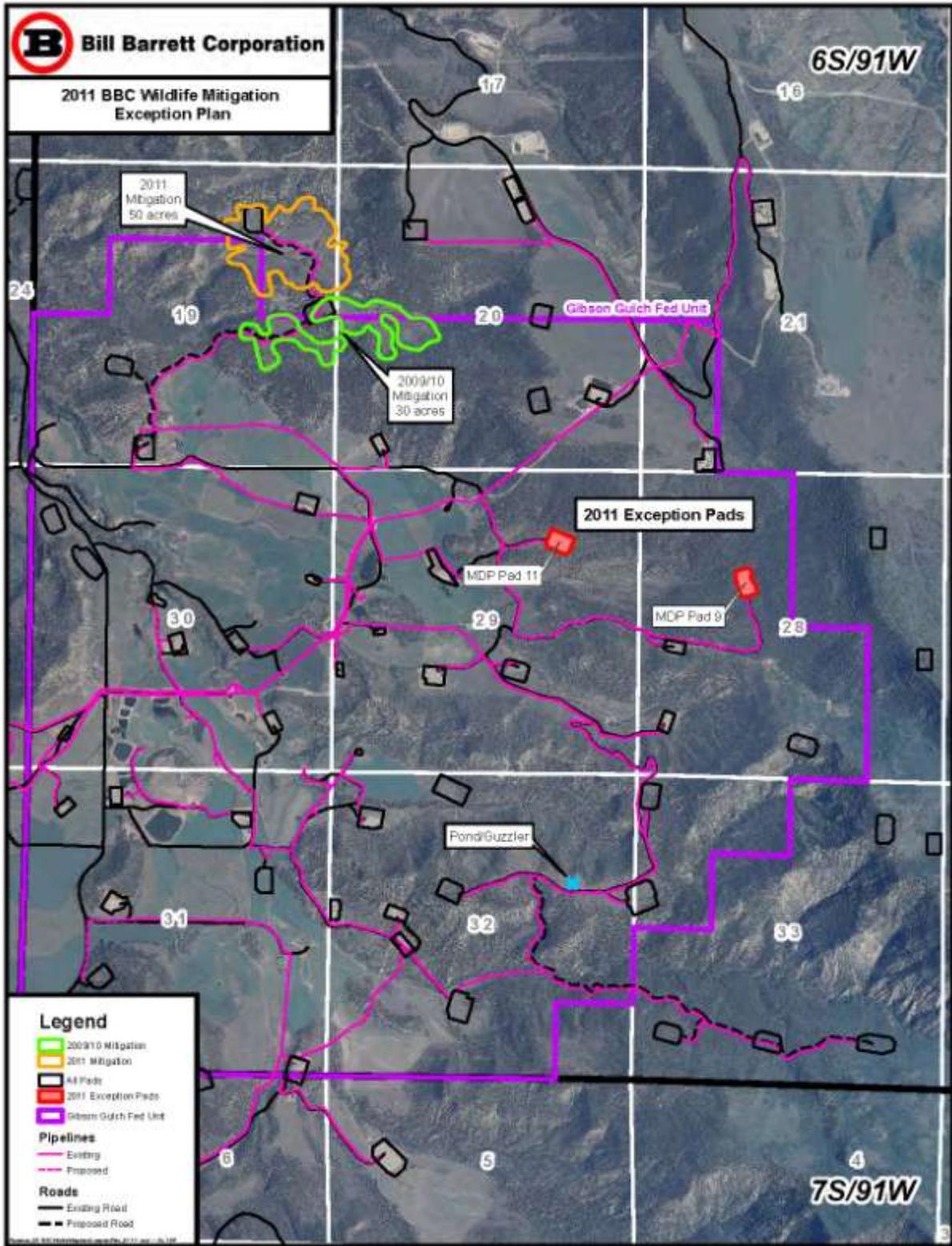
VI. Treatments

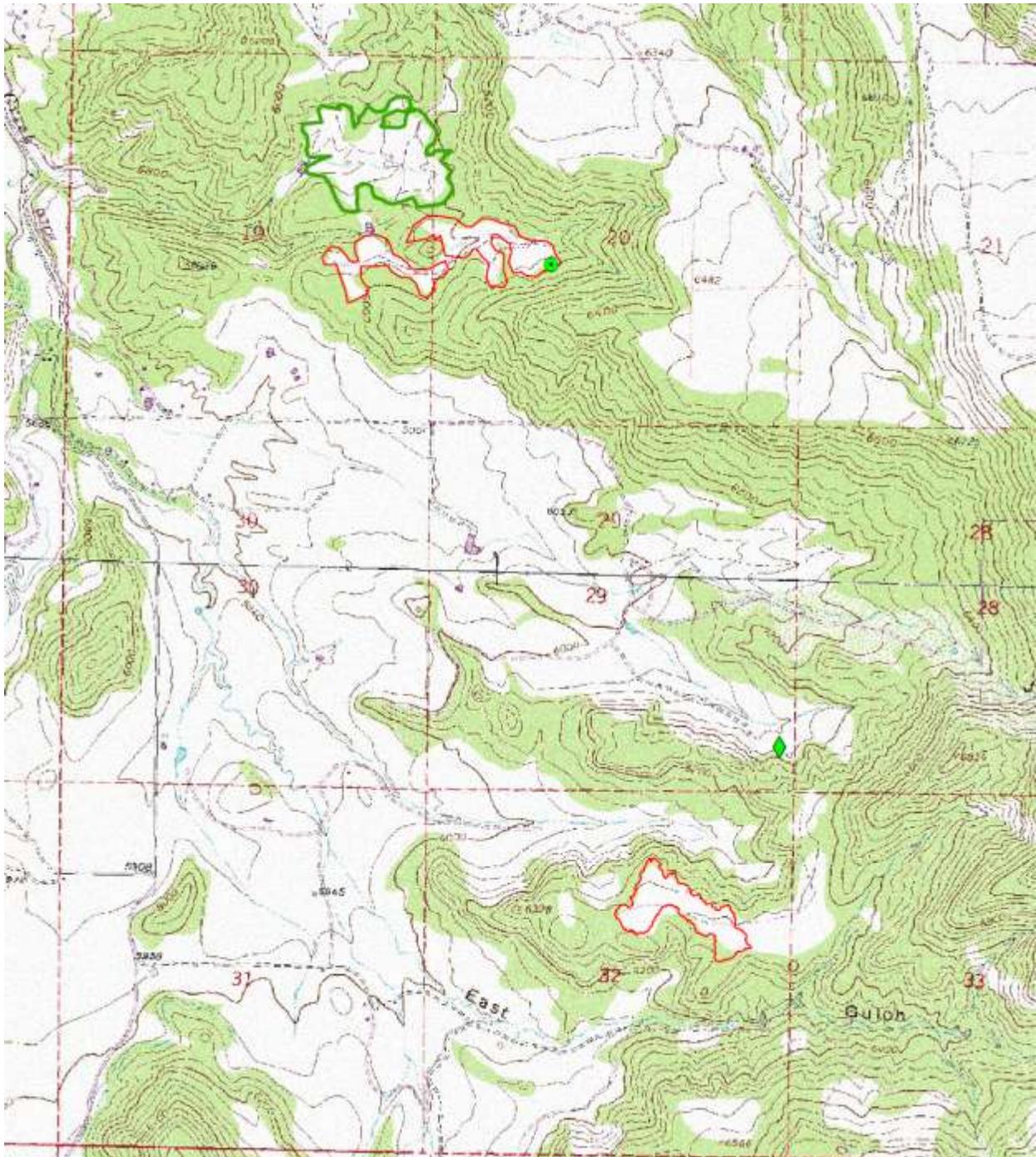
The proposed Hydro-axe treatments are designed to remove juniper trees in areas that have been encroaching in historic sagebrush communities. Due to the prevalence of cheatgrass, attempts will be made to disturb the understory as little as possible to prevent cheatgrass from taking over the site. The herbicide treatment is designed to reduce the competition of cheatgrass in a stand of sagebrush that is currently providing forage for big game, but is in jeopardy of being lost due to the invasive nature of cheat grass being able to exclude native vegetation from a site.

The water developments are designed to allow wildlife to utilize the surrounding habitats reducing their movements and associated energy expenditures. Increased water will allow use earlier in the fall and later into the spring.

VII. Monitoring and Maintenance

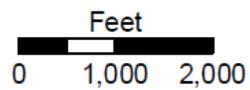
Upon completion of the water-feature enhancements, monitoring and maintenance of the enhancements will be undertaken by the BLM. As noted above, the area that is treated with herbicide will be evaluated in the fall of 2012 to determine the effectiveness of the treatment and the need for application of seed. Any seeding or additional treatments will be undertaken by BLM or by BBC via a separate agreement with BLM.





Legend

- Herbicide
- Hydro-Axe
- Guzzler
- ◆ Pond



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Appendix C

Public Comments on the Proposed Action and BLM Responses

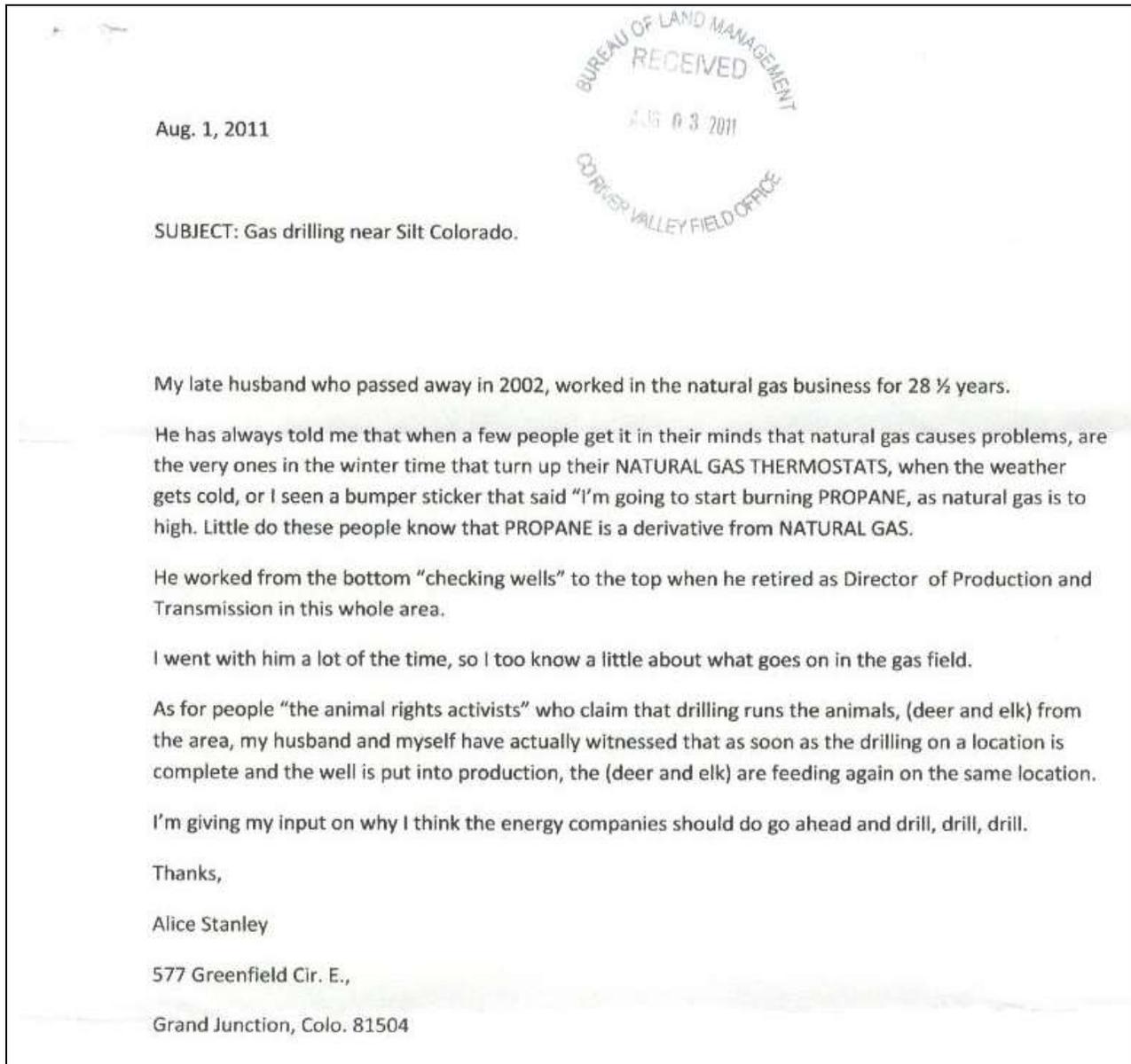
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APPENDIX C.

**BLM RESPONSES TO PUBLIC COMMENTS
ON THE GIBSON GULCH II MASTER DEVELOPMENT PLAN PROPOSED ACTION**

The BLM Colorado River Valley Field Office (CRVFO) received comments from State, County, and local government entities, environmental groups, and private citizens during the public scoping process for the GGIIMDP. The comments are presented below, along with BLM's responses.

LETTER FROM ALICE STANLEY, AUGUST 1, 2011



Response: Comments noted. Thank you for your participation in the public process.

LETTER FROM ANTERO RESOURCES, GERALD ALBERTS, AUGUST 2, 2011



Antero Resources
1625 17th Street
Denver, Colorado 80202
Office 303.357.7310
Fax 303.357.7315

Allen Crockett
Supervisory Natural Resource Specialist
Bureau of Land Management
Colorado River Valley Field Office
2300 River Frontage Road
Silt, Colorado 81652

August 2, 2011

Dear Mr. Crockett:

In response to BLM's request for comments regarding Bill Barrett Corporation's (BBC) Proposed Action for the Gibson Gulch II Master Development Plan (GGIIMDP) for Natural Gas Exploration and Development, Antero Resources Piceance Corporation (Antero) would like to note a conflict of interest between the two parties relative to three of BBC's planned pads and associated access roads and pipeline routes .

Three proposed BBC pads (MDP24, MDP25, and MDP26) and infrastructure needed to access these pads currently lay within existing Antero project boundaries in North Castle Springs (DOI-BLM-CO-N040-2010-0032-EA) and directly overlay Antero's proposed future development (Exhibit A). Antero has begun discussions with BBC to design alternate or modified infrastructure plans, however, at the time of this comment submittal, no resolution has been agreed upon and documented.

In conclusion, Antero requests that the BLM facilitate continued conversations between both operators. Antero also seeks through this comment submittal that prior to any BLM approval of an APD related to BBC's development of MDP24, MDP25, or MDP26, infrastructure realignment and/or infrastructure sharing be resolved such that both operators are capable of developing their leases efficiently.

If you have any questions or concerns regarding this comment or attachments, please feel free to contact me via email or phone.

Sincerely,

Gerald Alberts
Environmental and Regulatory Manager
Antero Resources Piceance Corporation
jalberts@anteroresources.com
303-357-7341



Response: We realize that an overlap exists between BBC's leasehold and Antero's project boundary in Section 33. We would communicate closely with Antero on items, such as field visits, that of importance to either Antero's North Castle Springs or BBC's Gibson Gulch II developments.

LETTER FROM COLORADO PARKS AND WILDLIFE, J.T. ROMATZKE, AUGUST 20, 2011

The comment letter from Mr. Romatzke on behalf of Colorado Parks and Wildlife (CPW), formerly the Colorado Division of Wildlife (CDOW), is attached in its entirety at the end of this appendix. The following are excerpts of the specific comments included in that letter.

Comment 1: *The GGIIMDP is contiguous with the Kokopelli, Gibson Gulch, Gibson Gulch II, Castle Springs, and North Castle Springs. The surface area encompassed by these five MDPs is about 190,000 acres, most of which is mapped as mule deer critical winter range and elk concentration areas, and they make up a vital migration corridor between high elevation around Sunlight Peak and low elevation in the GCSWA. As stated in the 1999 land use plan, the GAP [MDP] environmental assessment will evaluate the effects of all past oil and gas development within the geographic area.*

Response: Cumulative impacts of the cited MDPs are included in the attached EA at Section 4, which includes quantitative information on some of the metrics identified in the comment.

Comment 2: *Existing roads within the boundary of the GGIIMDP are not fully described and included in the proposed action. How will existing roads be incorporated into the development plan? How many existing roads can be used without building or upgrading new roads? The proposal makes a reference to the possibility of a road sharing agreement which would eliminate 0.5 mile of road disturbance. An accurate and meaningful analysis cannot be completed until an agreement is in place. The proposal does not identify or quantify the amount of indirect impacts to wildlife caused by roads.*

Response: Approximately 8 miles of existing oil and gas roads will be utilized as part of the GGIIMDP. For additional information, see Section 3.1, Access and Transportation. Regarding the agreement with Antero, we feel that analyzing the potential of a shared road is justified. Antero's proposed road—analyzed in its North Castle Springs MDP—coincides with BBC's proposed road and pad locations in several places. Regarding the issues with wildlife, indirect impacts from disturbance associated with vehicular traffic on access roads is described and analyzed in Section 3.22, Terrestrial Wildlife.

Comment 3: *Existing wells and well pads are not mentioned in the proposed action. There are 86 permitted wells from the Gibson Gulch MDP that are within the boundary of GGIIMDP that are not accounted for or proposed for analysis in the cumulative impacts. What is the state of production for these wells and how much truck traffic are they generating? How will traffic be incorporated with proposed new traffic and how will that be analyzed cumulatively? What is the state of reclamation for the abandoned or non-producing wells?*

Response: First, development from BBC's first phase (Gibson Gulch) is nearly complete. Two pads and associated wells remain in development, and are scheduled to be completed in 2012. Interim reclamation will begin in late fall 2011 on all pads in the Gibson Gulch area. No abandoned wells are present in the project area. For a detailed traffic analysis, see Section 3.1, Access and Transportation.

Comment 4: *Gathering lines, water lines, and pipelines that are already in place serving existing wells are not identified or accounted for in this PA. How will existing lines be used to reduce new infrastructure needs? How much reduction in truck traffic results from using piped water?. CP&W supports Barrett's efforts to reduce truck traffic.*

Response: Only 2.8 miles of new pipeline would be installed as a part of the GGIIMDP. The majority of pipelines would be installed concurrently and alongside the new roads. Only a small portion of pipeline (254 feet) is proposed to run cross-country to an adjacent tie-in line. These new lines will tie into existing lines that were approved under the GGMDP. Regarding truck traffic, BBC plans to utilize a combination

of pipelines and grouped collection facilities for both water and condensate storage and transfer. This would significantly reduce truck traffic.

Comment 5: *New compressor stations are mentioned in vague passing, while existing compressor stations are not mentioned at all. Will the PA be analyzed for compressor noise impacts for all well pads and will the analysis present a range of impacts and permutations with other variable impacts?*

Response: BBC does not plan on installing any additional compressor stations at this time. If a need for it arises, small compressors may be installed on individual pads temporarily. These would be housed and muffled appropriately so as to reduce noise impacts.

Comment 6: *Past weed management activities intended to manage weeds and undesirable, non-native vegetation is not addressed in this plan. How successful have past efforts been at controlling and managing weeds? What is the state of progress of weed management on reclaimed facility and pipeline sites? How effective have weed management actions been to improve wildlife habitats on disturbed locations?*

Response: BBC complies with the BLM's weed management plan and submits reports at the end of each year. In addition, BBC would comply with the standard Conditions of Approval (COAs) that BLM has attached to this MDP and would attach to any APDs, ROWs, or other authorizations issued pursuant to this EA. Detailed procedures for weed control and reclamation are outlined in these COAs. Generally speaking, weed control and reclamation have been successful in the Gibson Gulch area, and we expect it to continue to improve with the upcoming reclamation planned for this fall.

Comment 7: *The PA should include a summary of wildlife mitigation actions that are adjacent to GGII as well as a depiction of what and where they are in relationship to this PA.*

Response: BBC's wildlife mitigation plan is provided with the EA as Appendix B.

Comment 8: *The development activity should be planned and implemented through a phasing plan were one area of the MDP is constructed, drilled, and in a state of interim reclamation before moving on to another area of the MDP.*

Response: The BLM agrees with this comment and encourages operators to use it as much as possible. Unfortunately, other factors that influence where and when pads and wells will be developed (market value, seasonal constraints, etc.) are not always within BLM's ability to influence, nor do we have authority to require phased and clustered development outside some specific agreement—analogueous to the "CPOD" concept being applied by the BLM and CPW relative to some large-scale projects undertaken by other operators.

Comment 9: *The PA does not specify which type of drilling operation will be used. The PA states that "drilling will be accomplished with either a closed-loop, conventional or semi-closed loop system." Will the BLM analyze all three alternatives?*

Response: BBC has indicated they would be using closed-loop drilling. The PA section of the MDP has been changed to reflect this decision.

Comment 10: *It appears that Barrett makes a contradictory statement about the use of drilling fluids; one paragraph states that conventional water-based muds would be used, then a subsequent paragraph claims that non-toxic materials may be added to the mud system. How will BLM analyze the inconsistency?*

Response: BBC would use a water-based mud system as opposed to a diesel fuel-based mud system, which the CRVFO does not allow. In regard to the “non-toxic materials,” BBC is referring to components such as walnut shells, saw dust, barite clay, and other additives used to increase the weight of the mud. This is described in Section 2.1.5, Drilling Operations.

Comment 11: *Barrett proposed to use completions pits for each well pad or a centrally located pit; the pits will be used as a repository for flowback fluids. Will both scenarios be analyzed? Will BLM require fencing and netting standards so that wildlife is excluded from the pits?*

Response: BBC would be required to fence their pits. The BLM does not require flagging or netting of pits that are used for completions, as that water is typically not in the pit for an extended period of time. Should they need an open pit for an extended period of time, the BLM would require the pits to be netted or flagged.

Comment 12: *The BLM should analyze the project with the lease assigned stipulations and COAs. Without knowledge of specific lease information and which areas will utilize management prescriptions such as CSUs and NSOs, one cannot readily make decisions regarding whether or not the GGIIMDP would lead to a Finding of No Significant Impact.*

Response: Lease stipulations are outlined in Section 2.1.11 and Table 3. The sections on Migratory Birds (3/7), Special Status Species (3.16), and Terrestrial Wildlife (3.22) address wildlife in relation to the lease stipulations and COAs to be applied by the BLM.

Comment 13: *Barrett should provide a weed management plan, stormwater management plan, fire prevention plan, fire protection emergency action plan, spill prevention and control and countermeasure plan, and a comprehensive water management system plan for inclusion and review with this proposed action. CP&W presumes that most BMPs would be detailed in these documents.*

Response: The BLM does not typically include such plans in the MDPs, but operators do have these plans onsite, and the BLM inspects and enforces oil and gas operations relative to most of the points raised in the comment. These are also addressed at appropriate places in the EA document.

Comment 14: *In addition to the aforementioned items, BLM must address the following issues:*

- *Biological survey findings should be incorporated into the EA.*

Response: This was done.

- *Education on bear-human encounters.*

Response: We would be happy to forward any CPW materials on this topic to the operator for distribution to its staff and contractors.

- *Carpooling should be encouraged for workers coming and going to the drilling site.*

Response: We encourage carpooling.

- *Trench plugs should be used during gas and water pipeline construction.*

Response: We will require these wherever a pipeline crosses a drainage or wetland in a way that could result in loss of supporting hydrology through lowering of the shallow water table.

- *Drill cuttings should have a liner and be bermed to prevent runoff.*

Response: Cuttings trenches are regulated by COGCC, and the BLM mirrors that agency’s requirements.

- *Barrett should identify the source of fresh water.*

Response: Fresh water is obtained from a commercial source in the Colorado River Basin.

- *Truck traffic reduction should be analyzed in the EA.*

Response: This was done.

- *CP&W recommends that pipeline test water (if pipelines are to be tested with water) not be discharged to any surface drainage due to the potential contaminant issues associated with pipeline pressure test water.*

Response: See the section on pipelines (2.1.3).

- *Barrett references raptor surveys and the application of a 0.25-mile buffer. CP&W supports the surveys and nest buffers. The raptor buffer distance varies by species and should be applied accordingly.*

Response: See the section on Migratory Birds (3.7) relative to raptor nesting buffers. Although we normally apply 0.25 mile for all hawks—as per our land use plan—we note that the recommended buffer for this species is 0.33 mile. We specify in the COAs that, notwithstanding whatever buffer we state, the operator remains subject to the MBTA, administered by the U.S. Fish and Wildlife Service and based on buffers recommended by CPW.

LETTER FROM WILDERNESS WORKSHOP, PETER HART, AUGUST 10, 2011

The comment letter received from Mr. Hart on behalf of Wilderness Workshop is attached in its entirety at the end of this appendix. The following are excerpts of the specific comments included in that letter.

Comment 1: *Council on Environmental Quality (CEQ) regulations require Federal agencies to consider "connected actions," "similar actions," and "cumulative actions" together with "direct" and "indirect" impacts. The CEQ regulations define similar actions as those that "have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography." The CEQ regulations also state when agencies ought to analyze such similar actions in a single impact statement. Agencies "should do so when the best way to assess adequately the combined impacts of similar actions or reasonable alternatives is to treat them in a single impact statement."*

While Federal agencies have considerable discretion in determining the scope of a NEPA document, there are situations where an agency must consider several related actions in a single NEPA document. BLM's obligation to analyze impacts extend beyond the immediate impacts of the project at hand to includes the cumulative impacts of the project, taken together with the impacts of existing, proposed, or reasonably foreseeable projects, on the environment. BLM must describe and analyze impacts beyond the borders of the Colorado River Valley Field Office and beyond the list of known future gas development projects. It is established that the cumulative impacts analysis must include "some quantified or detailed information...."

Response: The BLM is aware of these requirements and has included the types of analyses identified in the comment in the Cumulative Impacts Analysis at Section 4 of the EA, including detailed quantitative information. We note the analyses in our MDPs do address related actions of which the MDP proposed action is comprised, including collocated non-Federal oil and gas developments and existing oil and gas developments within the analysis boundary. We also note that, like all GAPs and MDPs prepared by the CRVFO in conjunction with proposed oil and gas exploration and development projects, the EA is tiered to the EIS for the most recent land use plan, in this case the 1984 RMP as amended by the 1999 Record of Decision and Resource Management Plan (BLM 1999b).

Comment 2: *Because of the obvious inadequacies of the Glenwood EIS, the CRVFO has for a long time been tiering to the 2006 Roan Plateau RMPA/EIS (Roan EIS) to justify ongoing development. That practice is inappropriate for a number of reasons. First, the Roan EIS explicitly excludes from its analysis the impacts of natural gas development occurring outside the Roan Plateau Planning Area (RPPA). In other words, that analysis is applicable only to a defined geography. In this case, as with many already approved projects, since this proposed Gibson Gulch II MDP is not within the RPPA, the Roan EIS is inapplicable.*

Furthermore, the Roan EIS does not adequately analyze air quality impacts of oil and gas development. For example, that EIS fails to analyze potential impacts to several Class I airsheds of oil and gas development. It fails to use statutory baseline dates to determine compliance with Prevention of Significant Deterioration (PSD) increments. It fails to quantify ozone emissions from oil and gas development. And it fails to consider whether emissions would contribute to violation of National Ambient Air Quality Standards (NAAQS) for ozone. The CRVFO has now used the Roan Plateau EIS to authorize more development than the document analyzes.

Response: The air quality impacts analysis presented in the GGIIMDP at Section 3.2 was not based on the Roan modeling but on the recent air quality modeling performed in connection with an RMP revision currently underway. Consequently, the GGIIMDP makes no reference to the Roan air quality modeling. The results of the new air quality model are presented in the Air Resources Technical Support Document (ARTSD) referenced in Section 3.2 and available on the BLM CRVFO web site. The recent modeling addressed the entirety of the oil and gas production area of the CRVFO area with a reasonable foreseeable development scenario and included a much larger number of oil and gas wells than the Roan Plateau RMPA/EIS. The analysis specifically addressed ozone with the use of photochemical grid modeling programs. The results of the modeling were similar to those for the earlier Roan modeling in that no potentially significant air quality impacts were projected for projects of the scale of the GGIIMDP, individually and cumulatively.

As a point of clarification, the CRVFO has, approved 1,512 Applications for Permits to Drill (APDs) based on the Roan air quality modeling, compared to the number of wells (1,570) assumed in the Roan model. The number analyzed in the Roan model will not be exceeded and, as noted in the paragraph above, we are now using the new air quality model to analyze oil and gas projects.

Comment 3: *BLM should undertake an EIS to analyze potential impacts of this proposal as well as all connected, similar, and cumulative actions, and their direct and indirect environmental consequences. Tiering to stale programmatic analyses does not satisfy mandates of NEPA. Without any programmatic analysis to tier to, an EIS will be necessary to adequately assess potential impacts associated with this MDP—especially to adequately analyze potential air quality impacts.*

Response: The BLM disagrees that an EIS is required for this project. Although the current CRVFO land use plan was completed in 1984, it has been amended on multiple occasions to address emerging issues, including plan amendments in 1991 and 1999 specific to oil and gas development. The CRVFO staff continually updates resource information, including a Geographic Information System (GIS) database, and maintains familiarity with on-the-ground conditions through a combination of periodic land health assessments and the steady flow of new projects requiring fieldwork and review of available information in conjunction with numerous EAs prepared each year. Consequently, our impact analyses and mitigation are not based on “stale” information but continually refined. Indeed, the air quality modeling to which the GGIIMDP air impacts analysis refers was completed during late summer 2011.

Comment 4: *BLM must do a better job analyzing specific connected actions. In this case, Bill Barrett Corporation received approval to develop over 100 Federal wells at Gibson Gulch in 2009. That project*

area is within 0.5 mile of the proposed GGIIMDP. Yet, there is not any mention of it in the MDP. These proposals are proximate in distance, time, and they share common ownership. They should be analyzed together.

To ensure that BLM is adequately analyzing all connected actions and cumulative impacts, the agency should prepare a map of MDPs, pads and wells, roads, and associated infrastructure in the area for inclusion in any final environmental analysis. The agency cannot continue to analyze project proposals in a piecemeal fashion. Instead, the agency should begin publicly painting the bigger picture and holistically analyzing impacts of oil and gas development within the CRVFO.

Response: The BLM has considered the cited oil and gas projects in the project vicinity in its cumulative impacts analysis. With respect to air impacts in general, previous responses above have noted that the GGIIMDP air quality analysis was completed with reference to the recent air quality modeling ARTSD, which specifically included analyses of cumulative impacts from existing and reasonably foreseeable oil and gas developments in the CRVFO area.

Comment 5: *BLM must specifically consider ozone and ground level ozone impacts. Ozone is one of the most significant types of air pollution. Ozone is formed when volatile organic compounds (VOCs) and nitrogen oxides (NOX) react in the atmosphere. Ozone causes a variety of adverse health impacts, including respiratory problems such as lung inflammation and asthma, and can even lead to premature death. Elevated ozone levels also injure vegetation and forest health, as well as wildlife, and cost agriculture hundreds of millions of dollars annually in reduced crop yields.*

Colorado estimates that oil and gas development is the largest source of ozone generating VOC pollution in the State [and] 87 percent of all human-caused VOC emissions and 72.5 percent of human-caused NOX emissions in Garfield County. Garfield County monitoring has recorded ozone levels that may violate the National Ambient Air Quality Standards, especially if the standard is tightened [to lower than the current 0.075 ppm]. For example, a 2007 study recorded ozone levels that approached or exceeded 0.075 ppm.

Response: Potential ozone-related impacts analysis for the GGIIMDP were addressed through an air quality analysis that used the recent modeling conducted in connection with the RMP revision currently underway. The modeling indicates that no violations of the Federal ozone, VOC, or NOX standards are predicted for any alternative, including Alternative A (current management).

Regarding the portion of industrial emissions in Garfield County attributable to oil and gas activities, it should be noted that this is a largely undeveloped area with little industrial development other than oil and gas. Therefore, it is not surprising that the majority of these emissions may be associated with oil and gas, since few other sources exist. This observation would not by itself demonstrate that absolute emission values are high or problematic. As indicated in the previous paragraph, the recent air quality modeling does not predict violations of ozone or NOX standards as a result of foreseeable oil and gas development over the next 20 years.

Regarding Garfield County monitoring data, any occasional values that may have “approached or exceeded” the NAAQS standard do not constitute a “violation” of the standard, which is based on average values over an 8-hour period instead of short-duration excursions. We are unaware of violations per se. We also note that Garfield County is not classified as a non-attainment area for ozone.

Comment 6: *BLM must analyze and consider potential impacts from benzene emissions, a known human carcinogen. Colorado estimates that oil and gas sources emit 67 percent of the benzene in Garfield County. That number is increasing as BLM approves oil and gas development in the area, but the agency*

has not adequately analyzed it. The agency cannot continue to ignore impacts resulting from activities that it approves.

Response: As noted in the response to the previous comment, Garfield County is a largely undeveloped area with few industries other than oil and gas. It is therefore not surprising that oil and gas activities may account for a majority of the total emissions of benzene. A percentage alone would not demonstrate that emissions associated with oil and gas developments are large in an absolute sense or problematic relative to human health. Indeed the recent air quality modeling completed in conjunction with the current RMP revision predicted no adverse impacts on human health from benzene emissions associated with oil and gas development over the next 20 years.

Accepted methods for risk assessment were used to evaluate the incremental cancer risk for benzene. Based on the Superfund National Oil and Hazardous Substances Pollution Contingency Plan, a cancer risk range of one cancer in 1 million (10^{-6} risk) to 100 cancers in 1million (10^{-4} risk) is generally acceptable. Cancer risks for each of the HAPs individually and for combined exposure to both HAPs for are within or below the acceptable range the most likely exposed individual (MLE) and the maximally exposed individual (MEI). For the MLE, an individual could encounter a maximum cancer risk due to benzene of up to 0.16 cancers in 1 million. The greatest predicted MLE risk due to formaldehyde is 0.00009 in 1 million. For the MEI, the model predicts a risk of up to 0.45 due to benzene exposure and up to 0.00026 due to formaldehyde exposure.

These modeling results were the basis for the air impacts analysis presented in the GGIIMDP at Section 3.2, including benzene and other Hazardous Air Pollutants (HAPs).

Comment 7: *BLM must consider any potential impacts to Class I airsheds. The Clean Air Act designates wilderness areas and national parks as “Class I” areas, and sets a national goal of avoiding any human-caused impairment of visibility there. Several Class I areas are located in Western Colorado, including the Black Canyon of the Gunnison National Park, Maroon Bells-Snowmass Wilderness Area, Flat Tops Wilderness Area, and West Elk Wilderness Area. Emissions from oil and gas development and other human activities have caused substantial adverse effects to air quality in these Class I areas. Any additional impacts must be analyzed and disclosed and BLM, as well as other Federal agencies, must take affirmative steps to avoid further impairment and restore air quality in these areas.*

Response: The recent air quality modeling used in the GGIIMPD air impacts assessment specifically addressed potential visibility impacts for several Class I areas, including Arches National Park, Eagles Nest Wilderness Area, Flat Tops Wilderness Area, Maroon Bells-Snowmass Wilderness Area, Mount Zirkel Wilderness Area, Rocky Mountain National Park, and Rawah Wilderness Area, as well as sensitive Class II areas. Based on the alternatives analyzed and their associated assumptions, the analysis predicts no or negligible (one day per year at one Class I area) of impacts from the reasonably foreseeable oil and gas development of which this project is part.

Comment 8: *BLM must ensure compliance with Prevention of Significant Deterioration (PSD) requirements by aggregating interrelated and adjacent sources in any analysis. In this case, BLM must ensure that emissions from proposed gas wells are aggregated together with other interrelated and adjacent sources and/or other sources owned or under common control by Bill Barrett and affiliates. This is the only way to ensure compliance with PSD regulations and the Colorado State Implementation Plan (SIP). The proposed wells and downstream compressor stations and/or other pollutant emitting activities are all interrelated, adjacent, and under common ownership or control. Furthermore, they are all part of the same industrial grouping. According to the Standard Industrial Classification Manual, producing natural gas wells and related facilities fall under Major Group 13, or “Oil and Gas Extraction.”*

Response: The recent air quality modeling analysis that was used in the air impacts analysis for the GGIIMDP included a Prevention of Significant Deterioration (PSD) Class I and Class II increment analysis comparison. However, PSD increment comparisons performed under NEPA are provided for informational purposes only and are not regulatory PSD increment consumption analyses. Predicted concentrations are well below PSD increments for all pollutants and averaging times at Class I and sensitive Class II area receptors

Comment 9: *BLM must give personal notice of any draft or final EA or EIS to all parties who submitted comments and provide a meaningful opportunity for public review and comment prior to issuing a final decision.*

Response: The CRVFO's long-standing procedure for public scoping of EAs performed in conjunction with oil and gas MDPs, including the GGIIMDP, is to publish the Proposed Action for public review and comment. The input from public reviewers is then incorporated into the EA. This process is consistent with NEPA.

Comment 10: *In addition to the aforementioned items, BLM must analyze, consider, and disclose:*

- *Greenhouse gas emissions and global warming contributions resulting from this project.*
- *Impacts to plant and wildlife species, including threatened, endangered, or sensitive species and impacts to habitat.*
- *Potential impacts to human health resulting from this proposal.*

Response: The BLM believes that it has addressed adequately the items listed in the comment. Climate change impacts and greenhouse gas emissions are discussed in Section 3.2 of the GGIIMDP, which also addresses human health effects. Special status plants and wildlife are discussed in Section 3.16, and issues involving mule deer and elk are addressed in Section 3.22.



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August 20, 2011

Bureau of Land Management
Attn: Allen Crockett, Supervisory Natural Resource Specialist
Colorado River Valley Field Office
2300 River Frontage Road
Silt, CO 81652



RE: Gibson Gulch II Master Development Plan

Dear Mr. Crockett:

Thank you for the opportunity to comment on the Bill Barrett Corporation (BBC) Gibson Gulch II Master Development Plan (GGIIMDP) located in Sections 19, 20, 29, 32, 33, and 34, Township 6 South, Range 91 West. The Colorado Parks and Wildlife, (CP&W) has reviewed the Master Development Plan (MDP).

CP&W identifies this area - Bureau of Land Management (BLM) and private surface within the boundary of the proposed MDP - as being mule deer critical winter range and elk winter concentration areas. Other species and habitats identified within the planning area boundary, as depicted by the Natural Diversity Information Source (NDIS), 2011 mapping include raptor nest sites (section 19 locations) and turkey production area in the south ½ of section 32.

CP&W offers the following comments on the Proposed Action as it is tiered to the 1999 GSRA Oil and Gas Leasing and Development ROD.

The GGIIMDP boundary is contiguous with the Kokopelli, Gibson Gulch, North Castle Springs, and Castle Springs Master Development Plans; the surface area encompassed by these five MDPs totals about 19,000 acres, most of which is mapped as mule deer critical winter range and elk winter concentration area. The 19,000 acre area is bounded on the west by Divide Creek Road and the Garfield Creek State Wildlife Area on the East. Collectively, the area extends from lower elevations near the Colorado River up to mid elevation on East Divide Creek south of East Gulch.

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- cannot be completed unless the existing roads are analyzed along with proposed new roads.
- c. The proposal makes reference to the possibility of a road sharing agreement (page 6) which would eliminate ½ mile of road disturbance. An accurate and meaningful analysis cannot be completed until an agreement is in place, if it is not finalized an alternative analysis would have to be prepared based on additional road disturbance.
 - d. The proposal does not identify or quantify the amount of indirect impacts to wildlife caused by roads.
- 2) Existing wells and well pads are not mentioned or included in the proposed action
 - a. According to COGCC records there are 86 permitted wells from the Gibson Gulch MDP that are within the boundary of GGII that are not accounted for or proposed for analysis in the cumulative impact for this proposed action.
 - b. What is the state of production for the existing wells, and how much truck traffic are they generating? How many daily, weekly, monthly vehicle trips are resulting for the existing wells and how or will that information be incorporated with proposed new traffic and how or will that be analyzed cumulatively?
 - c. What is the state of reclamation for the abandoned or non-producing wells?
 - d. How may abandon and plugged wells are there? What is the state of reclamation on these wells? How does the state of reclamation affect current impacts, how much current impact – if any - is being offset by reclamation?
 - 3) Gathering lines, waterlines, and pipelines that are already in place serving existing wells are not identified or accounted for in this PA. The PA does mention that there are some existing lines that exist but fails to develop the idea further; for example how will the existing lines be used to reduce new infrastructure needs.
 - a. How extensive will the fresh water lines be incorporated from existing to new development.
 - b. How much reduction in truck traffic will result from piped water, it is not quantified in the PA. CP&W supports Barrett's efforts to reduce truck traffic.
 - 4) New compressor stations are mentioned in vague passing, while existing compressor stations are not mentioned at all.
 - a. Will the PA be analyzed for compressor noise impacts for all well pads, partial wells on well pads or without compressors. Will the analysis present a range or impacts and permutations depicted with permutations with other variable impacts?

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- 5) Past weed management activities intended to manage weeds and undesirable, non-native vegetation is not addressed in the plan. Previous MDP actions that have been taken to control and manage weeds adjacent to this location and they should be described within the PA.
 - a. How successful have past efforts been at controlling and managing weeds. What is the state of progress of weed management on reclaimed facility and pipeline sites?
 - b. How effective have weed management actions been to improve wildlife habitats on disturbed locations?

- 6) The PA should include a summary of wildlife mitigation actions that are adjacent to GGII as well as a depiction of what and where they are in relationship to this PA.
 - a. In addition, the PA should include a progress summary of activities and outcomes to date.

The following list of items requires additional development and explanation so that CP&W can make an accurate assessment of potential impacts to wildlife.

- 1) The development activity should be planned and implemented through a phasing plan where one area of the MDP (for example Section 19 pads and wells) is constructed, drilled and be in a state of interim reclamation before moving on to another area of the MDP (for example Section 32-34 wells and pads).

- 2) How will the drill method be analyzed? The PA does not specify which type of drilling operation will be used. The PA states that "drilling will be accomplished with either a closed-loop, conventional or semi-closed loop system." Will the BLM analyze all three alternatives to determine drilling impacts from each method?

- 3) It appears that Barrett makes a contradictory statement about the use of drilling fluids; one paragraph states that conventional water based muds will be used, then a subsequent paragraph claims that non-toxic materials may be added to the mud system. How will BLM analyze the inconsistency?

- 4) Barrett proposed to use completions pits for each well pad or a centrally located pit; the pits will be used as a repository for flowback fluids. Will both scenarios be analyzed?

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- b. Will the BLM require fencing and netting standards so that wildlife is excluded from entry in to the flowback pit.
- 5) The BLM should analyze the project with the lease assigned stipulations and COAs. Without knowledge of specific lease information and which areas will utilize management prescriptions such as CSU's and NSO's, one can not readily make decisions regarding whether or not the GGIIIMPD would lead to a Finding of No Significant Impact. The document does not adequately provide or synthesize the site-specific data into a format that is concise and understandable.

CP&W believes that Barrett should provide a weed management plan, storm water management plan, fire prevention plan, fire protection emergency action plan, and spill prevention control and countermeasure plan, and a comprehensive water management system plan for inclusion and review with this proposed action. CP&W presumes that most BMPs would be detailed in these documents.

Specific wildlife, wildlife habitat concerns that should be addressed and minimization measures be included as BMPs, COAs or lease stipulations in the ROD for the EA.

- c. If Barrett or designee conducts a biological inventory for the GGII planning area all findings should be fully incorporated into the EA.
- d. Barrett and subcontractors should establish an education program that focuses on reducing human-bear conflicts including; initiating a food and waste/refuse management program that uses bear-proof food storage containers and trash receptacles; establishing company policies to prohibit keeping food and trash in sleeping quarters; establishing company policies to support enforcement of state prohibition on feeding of bears; and reporting bear conflicts immediately to CPW. CPW can provide educational assistance if requested.
- e. Barrett should require carpooling for workers coming and going to the drilling site.
- f. Trench plugs should be use during gas and water pipeline construction period.
- g. Drill cutting should have a liner under them and bermed to direct runoff away and contain captured rain if they are stacked on location as indicated in the PA.
- h. Barrett should identify the source of freshwater.
- i. Reduction in truck traffic resulting from piped water is not quantified in the PA.
- j. If gas pipelines are pressure tested with water, CP&W recommends that the test water be captured and consigned to a certified disposal facility; CP&W requests that test water not be discharged to any surface drainage due to the potential contaminant issues associated with pipeline pressure test water.
- k. Barrett references the need to conduct raptor surveys and if nests are found apply a nesting buffer of 0.25 miles. CP&W supports the survey and the

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application of nest buffers; however, the buffer distance does vary by species and should be applied accordingly. The BLM and CP&W have, and can supply the appropriate buffer distances for raptors by species if the information is needed.

While our comments on the GGII PA are somewhat pointed and direct, it is not the intent of CP&W simply to be critical of the PA, but rather it is our intent to point out areas of the PA that can be improved which will benefit all parties involved. The CP&W is interested as a partner in the PA and has an interest in finding the best solutions for the PA.

Thank you for the opportunity to comment on the Bill Barrett Corporation's Gibson Gulch II Master Development Plan. The CP&W looks forward to a continued strong working relationship and dialogue on this important project. If you have any questions please do not hesitate to contact me at 970-255-6178.

Sincerely,



JT Romatzke, Area Wildlife Manager

Cc. Ron Velardé, NW Regional Manager
Dean Riggs, Assistant Regional Manager
Will Spence, District Wildlife Manager

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August 10, 2011

Colorado River Valley Field Office
2300 River Frontage Road
Silt, CO 81652
Via email: gsfomail@co.blm.gov

Dear Land Manager:

Subject: Gibson Gulch II MDP

Please accept these scoping comments on the proposed Gibson Gulch II Master Development Plan (MDP).

I. Scope of Analysis.

There are a number of existing, proposed, and reasonably foreseeable projects that must be analyzed along with the proposed project's environmental impacts. Council on Environmental Quality (CEQ) regulations require federal agencies to consider "connected actions," "similar actions," and "cumulative actions" together with "direct" and "indirect" impacts. 40 CFR § 1508.25. Connected actions are those that

1. "automatically trigger other actions which may require environmental impact statements,"
2. actions that "cannot or will not proceed unless other actions are taken previously or simultaneously," and,
3. actions that are "interdependent parts" of a larger action and "depend on the larger action for their justification."

40 CFR § 1508.25(a). The CEQ regulations define similar actions as those that "have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography." Id. The CEQ regulations also state when agencies ought to analyze such similar actions in a single impact statement. (Agencies "should do so when the best way to assess adequately the combined impacts of similar actions or reasonable alternatives is to treat them in a single impact statement." 40 CFR § 15.08.25.)

While federal agencies have considerable discretion in determining the scope of a NEPA document, there are situations where an agency must consider several related actions in a single NEPA document. In Fritiofson v. Alexander, the Fifth Circuit held that in a cumulative impact analysis, an agency should consider “(1) past and present actions without regard to whether they themselves triggered NEPA responsibilities and (2) future actions that are ‘reasonably foreseeable,’ even if they are not yet proposals and may never trigger NEPA-review requirements. 772 F.2d 1225, 1245 (5th Cir. 1985). The court stated:

Sections 1508.7 and 1508.27 require an analysis, when making the NEPA-threshold decision, as opposed to the EIS-scoping decision, whether it is “reasonable to anticipate cumulatively significant impacts” from the specific impacts of the proposed project when added to the impacts from “past, present, and reasonably foreseeable future actions,” which are “related” to the proposed project. The regulation does not limit the inquiry to the cumulative impacts that can be expected from proposed projects; rather, the inquiry also extends to the effects that can be anticipated from “reasonably foreseeable future actions.”

Id. at 1243; see also 42 U.S.C.S. §§ 4321-4347. For both EAs and EISs, BLM’s obligation to analyze impacts extends beyond the immediate impacts of the project at hand to include the cumulative impacts of the project, taken together with the impacts of existing, proposed, or reasonably foreseeable projects, on the environment. In order to comply with these mandates, the BLM must describe and analyze impacts beyond the borders of the Colorado River Field Office and beyond the list of known future gas development projects.

To ensure that combined impacts of separate activities do not escape consideration, NEPA requires BLM to consider cumulative environmental impacts in its environmental analyses. See Davis v. Mineta, 302 F.3d 1104, 1125 (10th Cir. 2002); see also Grand Canyon Trust v. Federal Aviation Admin., 290 F.3d 339, 345-47 (D.C. Cir. 2002). NEPA’s regulations provide that “effects” includes ecological, aesthetic, and historic impacts, “whether direct, indirect, or cumulative.” 40 C.F.R. § 1508.8. “Cumulative impact,” in turn, is defined as:

the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Id. § 1508.7.

Based on these regulations, NEPA documents must provide useful analysis of past, present, and future actions. City of Carmel-By-The-Sea v. U.S. Dept. of Transp., 123

F.3d 1142, 1160 (9th Cir. 1997); Muckleshoot Indian Tribe v. U.S. Forest Serv., 177 F.3d 800, 809-810 (9th Cir. 1999). As the D.C. Circuit has held, the fact that a project may result in even a small incremental increase in the overall impacts to a resource is meaningless if “there is no way to determine . . . whether [this small increase] in addition to the other [impacts], will ‘significantly affect’ the quality of the human environment.” Grand Canyon Trust, 290 F.3d at 346.

It is established that the cumulative impacts analysis must include “some quantified or detailed information” since without such information it is not possible for the court or the public to be sure that the agency provided the hard look that is required of its review. Neighbors of Cuddy Mountain v. Forest Service, 137 F.3d 1372, 1379 (9th Cir. 1998). “The Circuit has also explained that this analysis is particularly important in an EA. That is because so many more EAs than EISs are prepared, and thus there is a higher risk of cumulative impacts resulting from the many smaller decisions.”¹

II. Existing Programmatic Analyses are Inadequate.

The extent of authorized and existing oil and gas development in the Colorado River Valley Field Office (CRVFO) far exceeds what is analyzed in the 1999 Glenwood Springs Oil and Gas Leasing and Development Final Supplemental Environmental Impact Statement (Glenwood EIS). The Glenwood EIS analyzes the impacts from drilling only about 300 oil and gas wells in the resource area over a 20-year period. Furthermore, the Glenwood EIS fails to analyze a number of environmental impacts from oil and gas which have become significant (e.g., air emissions).

Because of the obvious inadequacies of the Glenwood EIS, the CRVFO has for a longtime been tiering to the 2006 Roan Plateau RMPA/EIS (Roan EIS) to justify ongoing development. That practice is inappropriate for a number of reasons. First, the Roan EIS explicitly excludes from its analysis the impacts of natural gas development occurring outside the Roan Plateau Planning Area (RPPA). In other words, that analysis is applicable only to a defined geography. In this case, as with many already approved projects, since this proposed Gibson Gulch II MDP is not within the RPPA, the Roan EIS is inapplicable.

Furthermore, the Roan Plateau EIS does not adequately analyze air quality impacts of oil and gas development. For example, that EIS fails to analyze potential impacts to several Class I airsheds of oil and gas development. It fails to use statutory baseline dates to determine compliance with Prevention of Significant Deterioration (PSD) increments. It fails to quantify ozone emissions from oil and gas development. And it fails to consider whether emissions would contribute to violation of National Ambient Air Quality Standards (NAAQS) for ozone.

Finally, the CRVFO has now used the Roan Plateau EIS to authorize more development than that document analyzes. The Roan Plateau EIS analyzes the impact of 1,570 federal wells over 20 years. BLM has used that EIS to approve 2,000 or more wells in recent years. The impacts of additional development have not been analyzed as required by

¹ Soda Mountain Wilderness Council v. Norton, (E.D. Cal. 2006), 2006 WL 769080; See Native Ecosystems Council v. Dombeck, 304 F.3d 886, 896 (9th Cir. 2002).

NEPA. The Roan Plateau EIS is now stale and cannot be used to justify ongoing approvals. Therefore, BLM must undertake new and thorough NEPA analysis prior to authorizing additional development.

III. BLM Should Prepare an EIS.

BLM should undertake an EIS to analyze potential impacts of this proposal as well as all connected, similar, and cumulative actions, and their direct and indirect environmental consequences. Tiering to stale programmatic analyses does not satisfy mandates of NEPA. Without any programmatic analysis to tier too, an EIS will be necessary to adequately assess potential impacts associated with this MDP.

IV. BLM Must do a Better Job Analyzing Impacts of Connected Actions.

BLM must do a better job analyzing specific connected actions.² In this case, Bill Barrett received BLM approval to develop over 100 federal wells at Gibson Gulch in 2009. That project area is within .5 miles of the proposed Gibson Gulch II MDP. Yet there is not any mention of it in the MDP. These proposals are proximate in distance, in time, and they share common ownership. They should be analyzed together.

To ensure that BLM is adequately analyzing all connected actions and cumulative impacts, the agency should prepare a map of MDPs, wells, and associated infrastructure in the area for inclusion in any final environmental analysis. The agency cannot continue to analyze project proposals in a piecemeal fashion. Instead, the agency should begin publicly painting the bigger picture and holistically analyzing impacts of oil and gas development within the CRVFO.

V. BLM Must Consider Ozone-related Impacts.

Any analysis must specifically consider ozone and ground level ozone. Ozone is one of the most significant types of air pollution. Ozone is formed when volatile organic compounds (VOCs) and nitrogen oxides (NOX) react in the atmosphere. Ozone causes a variety of adverse health impacts, including respiratory problems such as lung inflammation and asthma, and can even lead to premature death. See 73 Fed. Reg. 16436, 16436 (Mar. 27, 2008). Elevated ozone levels also injure vegetation and cost agriculture hundreds of millions of dollars annually in reduced crop yields.

Colorado estimates that oil and gas development is the largest source of ozone generating VOC pollution in the State. For example, oil and gas development accounts for more than 87 percent of all human-caused VOC emissions in Garfield County. The industry is also

² For example, Bill Barrett Corporation recently applied for a Clean Air Act Title V Operating Permit from the Colorado Air Pollution Control Division for the Mamm Creek Compressor Station. Despite the fact that the compressor will process gas generated from federal wells, including wells on the Miller #10 pad, the EA for those wells undertaken by BLM did not consider additional impacts of a compressor station. In other words, BLM authorized well development with an EA that failed to take into account connected actions.

responsible for 72.5 percent of the human-caused NOX emissions there.³ Oil and gas operations produce ozone-generating VOCs and NOX emissions from equipment such as condensate tanks, drill rig engines, compressor engines, glycol dehydrators, separators, and the increased vehicle traffic needed to construct, operate and maintain each well.

Under the Clean Air Act, the United States Environmental Protection Agency (EPA) sets national ambient air quality standards (NAAQSs). 42 U.S.C. §§ 7409, 7410. The EPA has established such NAAQSs for six air pollutants, including ozone, that can “endanger public health and welfare.” id. §§ 7408(a)(1)(A), 7409. The NAAQS for ozone is currently .075 parts per million (ppm) over an eight-hour period, but the EPA has proposed that the standard “instead be set at a lower level within the range of 0.060 to 0.070” ppm. 75 Fed. Reg. 2938, 2938 (Jan. 19, 2010). Garfield County monitoring has recorded ozone levels that may violate the NAAQS, especially if the standard is tightened. For example, a 2007 study recorded ozone levels that approached or exceeded .075 ppm.⁴ BLM must analyze the impacts ozone resulting from oil and gas operations is having on the human environment.

VI. BLM Must Consider other Hazardous Air Pollutants.

BLM must analyze and consider potential impacts from benzene emissions, a known human carcinogen.⁵ Colorado estimates that oil and gas sources emit 67 percent of the benzene in Garfield County.⁶ That number is increasing as BLM approves oil and gas development in the area, but the agency has not adequately analyzed it.

VII. BLM Must Consider Impacts to Class I Airsheds.

BLM must consider any potential impacts to Class I airsheds. The Clean Air Act designates wilderness areas and national parks as “Class I” areas, and sets a national goal of avoiding any human-caused impairment of visibility there. 42 U.S.C. § 7491(a)(1). Several Class I areas are located in Western Colorado, including the Black Canyon of the Gunnison National Park, Maroon Bells-Snowmass Wilderness Area, Flat Tops Wilderness Area, and West Elk Wilderness Area. Emissions from oil and gas development and other human activities have caused substantial adverse effects to air quality in these Class I areas. Any additional impacts must be analyzed and disclosed and BLM, as well as other federal agencies, must take affirmative steps to avoid further impairment and restore air quality in these areas.

³ www.colorado.gov/airquality/inv_maps_2008.aspx (last viewed June 9, 2011).

⁴ Phillip Yates, Garfield County ozone levels are high, Glenwood Springs Post Independent, available at: <http://www.postindependent.com/article/20080318/VALLEYNEWS/207716530> (last viewed June 8, 2011); see also State of Colorado Technical Support Document for Recommended 8-Hour Ozone Designations at 65 (March 9, 2009), available at <http://www.cdphe.state.co.us/ap/ozone/OZDesignations.pdf> (last viewed June 13, 2011).

⁵ Center for Disease Control Agency for Toxic Substances and Disease Registry, Toxic Substances Portal – Benzene (2007), available at <http://www.atsdr.cdc.gov/toxfaqs/TF.asp?id=38&tid=14> (last viewed June 8, 2011).

⁶ www.colorado.gov/airquality/inv_maps_2008.aspx (last viewed June 9, 2011).

VIII. BLM Must Ensure Compliance with PSD Requirements.

BLM must ensure compliance with Prevention of Significant Deterioration (PSD) requirements by aggregating interrelated and adjacent sources in any analysis. PSD regulations at 40 C.F.R. § 51.166(b)(5) define a stationary source as, "any building, structure, facility, or installation which emits or may emit a regulated [New Source Review] NSR pollutant." Regulations at 40 C.F.R. § 51.166(b)(6) further define "building, structure, facility, or installation" as "all of the pollutant emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control)[.]" The regulations further state, "Pollutant emitting activities are considered part of the same industrial grouping if they belong to the same 'Major Group' (i.e., which have the same first two digit code) as described in the Standard Industrial Classification Manual[.]"

In this case, BLM must ensure that emissions from proposed gas wells are aggregated together with other interrelated and adjacent sources and/or other sources owned or under common control by Bill Barrett and affiliates. This is the only way to ensure compliance with PSD regulations and the Colorado State Implementation Plan (SIP). The proposed wells and downstream compressor stations and/or other pollutant emitting activities are all interrelated, adjacent, and under common ownership or control. Furthermore, they are all part of the same industrial grouping. According to the Standard Industrial Classification Manual, producing natural gas wells and related facilities fall under Major Group 13, or "Oil and Gas Extraction."

With regard to the adjacency of these developments, although the EPA has noted that the distance associated with "adjacent" "must be considered on a case-by-case basis," the agency has noted that two pollutant emitting activities that are interdependent operations under common control can be considered adjacent when they are upwards of 20 miles apart or even greater. EPA noted that in relation to two interdependent facilities in Utah 21.5 miles apart, "the lengthy distance between the facilities 'is not an overriding factor that would prevent them from being considered a single source.'"

IX. BLM Must Give Adequate Opportunities for Public Review and Comment.

BLM must give personal notice of any draft or final EA or EIS to all parties who submitted comments and provide a meaningful opportunity for public review and comment prior to issuing a final decision

X. Additional Items for Analysis.

In addition to the aforementioned items, BLM must analyze greenhouse gas emissions and global warming contributions resulting from this project. The agency must consider and disclose impacts to plant and wildlife species, including T&E and sensitive and special-status species and impacts to habitat. And, finally, the agency must consider potential impacts to human health resulting from this proposal.

Thanks,

A handwritten signature in black ink, appearing to be the initials 'PH'.

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