

U.S. Department of the Interior
Bureau of Land Management
Colorado River Valley Field Office
2300 River Frontage Road
Silt, Colorado 81652

ENVIRONMENTAL ASSESSMENT

NUMBER

DOI-BLM-CO-N040-2011-0073-EA

CASEFILE NUMBER

Surface holes located on Fee lease; bottomholes in Federal Leases COC27869 and COC62160.

PROJECT NAME

Proposal to Drill 37 Wells from the Proposed NR23-3 Pad on Fee Land (Private Surface-Private Minerals) in the East Webster Mesa Area west of Rifle, Garfield County, Colorado.

PAD LOCATION

Proposed NR23-3 Pad: Township 6 South (T6S), Range 94 West (R94W), Section 3, NE $\frac{1}{4}$ SW $\frac{1}{4}$, Sixth Principal Meridian.

APPLICANT

Williams Production RMT Company. Contact: Greg Davis, 1515 Arapaho Street, Tower 3, Suite 1000, Denver, CO 80202.

PROPOSED ACTION

Williams Production RMT Company (“Williams”) proposes to drill and develop 37 new oil and gas wells (of which 27 would be Federal wells) from the proposed NR23-3 well pad located entirely on private property with underlying private minerals. The Federal wells would be directionally drilled from the Fee pad into two nearby Federal leases. No public access is available to the site, as the existing road crosses private lands at its juncture with U.S. Highway 6 and 24 near the West Rifle interchange on I-70. The planned wells would be drilled in two separate drilling visits with the first visit scheduled for September 2011 to drill four exploratory wells (three Fee wells and one Federal well identified in Table 1).

Although not specifically scheduled for the second visit to drill the remaining wells, it would be expected that the efficiency drilling would occur in the next 2 to 3 years.

A private field development road provides adequate truck access to the existing RWF512-11 pad and the nearby NR314-2 BLM pad on public land (Figure 1 and Figure 2-insert). From the NR314-2 pad north and west, approximately 10,850 feet (2.1 miles) of an existing two-track road would be reconstructed and portions of the road would be realigned to upgrade the access route for oil and gas development purposes. Approximately 17,800 feet (3.4 miles) of buried steel gas pipeline (12-inch diameter) and a buried produced water pipeline (6-inch diameter) would be buried in the same trench from the NR23-3 pad to a main gathering connection point near the valley floor south of the Golding 4 pad (Figure 1 and Figure 2-insert).

Table 1. Surface and Bottomhole Location of Proposed Federal Well

<i>Proposed Well</i>	<i>Surface Locations (Section 3, T6S, R94W)</i>	<i>Bottomhole Locations (Section 3, T6S, R94W)</i>
NR 514-3	NE $\frac{1}{4}$ SW $\frac{1}{4}$, 1887 feet FSL 1731 feet FWL	SW $\frac{1}{4}$ SW $\frac{1}{4}$, 1205 feet FSL 662 feet FWL

To conduct the well completion work, the existing 10-inch diameter surface poly line (shown in blue on Figure 2-insert) would be used to deliver treated water from the Grand Valley Evaporation Pond to the new pad. The poly line would remain as a surface line and not be buried as noted under Completions in Figure 2. Three high-pressure steel frac lines would be laid across the surface alongside the access road and proposed pipeline corridor from the remote frac site at the RWF512-11 pad to the NR23-3 pad. As noted under Production Equipment in Figure 2, storage tanks would be staged on the production pad after the initial drilling of the four wells. After the remaining 33 wells are drilled, produced water would be piped down to a tank farm to be established on the Golding 4 pad negating truck traffic related to water production.

The project area is located on an unnamed ridge that formed at the base of the Roan Plateau; Yellowslide Gulch is located about 1 mile northeast of the proposed pad. The NR23-3 pad would be located on a moderately sloped (15-35%) northeast-facing aspect within sagebrush habitat moderately stocked with encroaching young Utah juniper trees. There are relatively deep canyons and gullies located in the project vicinity that limit the opportunities to realign the existing road and reduce steeper road grades. Four exploratory wells would be drilled in 2011. If well completion and production testing provide economical results from these four wells, up to 33 more wells could be drilled during a follow-up visit to the pad in 2013 or beyond.

The proposed 600-foot by 330-foot pad would disturb approximately 10.7 acres to accommodate the planned wells and provide room for the well drilling and completion work (Figure 3). Topsoil would be stripped during the initial earthwork and windrowed around the pad perimeter. The pad would be designed to limit any excess material from pad construction. Cuttings generated from the numerous planned well bores would be placed in a trench that would be developed across the pad's west side against the cutslope. The pad would have a maximum cut of 34.3 feet at the southwest corner and a maximum fill of 34.5 feet at the northeast corner. Diversion ditches would be constructed to direct surface flow around the pad perimeter. After drilling and well completion work, the pad would be reshaped and seeded reducing the pad size to approximately 1.8 acres.

The road, pipeline, and pad construction work would follow the guidelines established in the BLM Gold Book, *Surface Operating Standards for Oil and Gas Exploration & Development* (USDI and USDA 2007). Final culvert locations and sizes would be determined during the preconstruction inspection and, if necessary, further refined after the road has been pioneered. During road pioneering, topsoil would be stripped and windrowed along the upper and lower sides of the road disturbance corridor to provide enhanced reclamation opportunities. The trees to be cleared for the road and pipeline work would be hydro-axed to reduce fuel loadings and visual impacts. Large boulders encountered during the road construction would be broken down with a hammer attachment on a trackhoe to control rolling material into the gullies and break the rock into more usable size for roadfill containment. The reconstructed access road would be built with a 24-foot-wide running surface. The road grade would average 10% with a couple of pitches approaching 15% because of the topographical inability to feasibly reduce the grades. The entire road would be surfaced with at least a 6-inch depth of gravel. A road maintenance program would be required during the production phase of the wells which includes, but is not limited to blading, ditching, culvert installation and cleanout, weed control, and gravel surfacing where excessive rutting or erosion may occur. Roads would be maintained in a safe and usable condition.

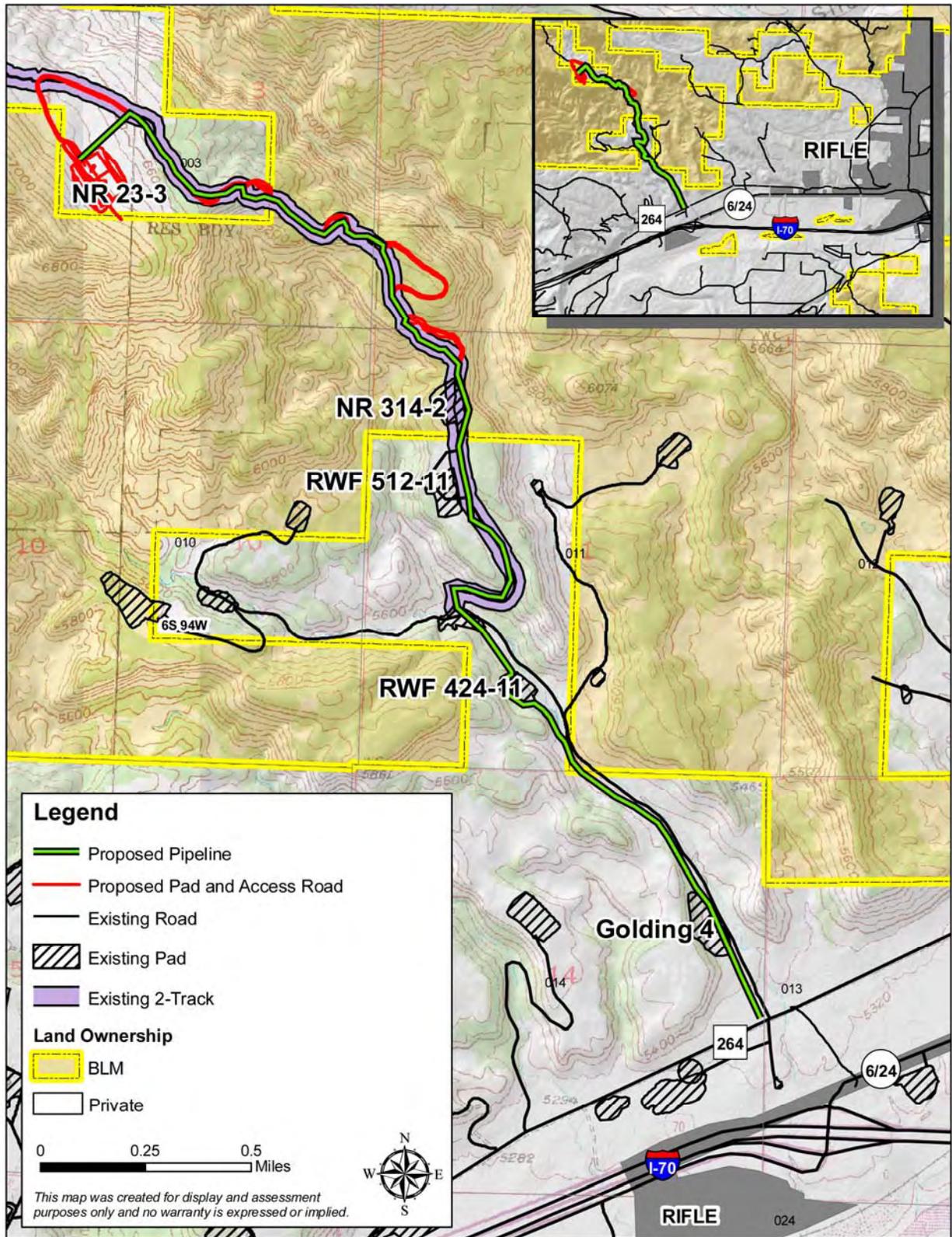


Figure 1. Project Map



Figure 2. Proposed Project Components.

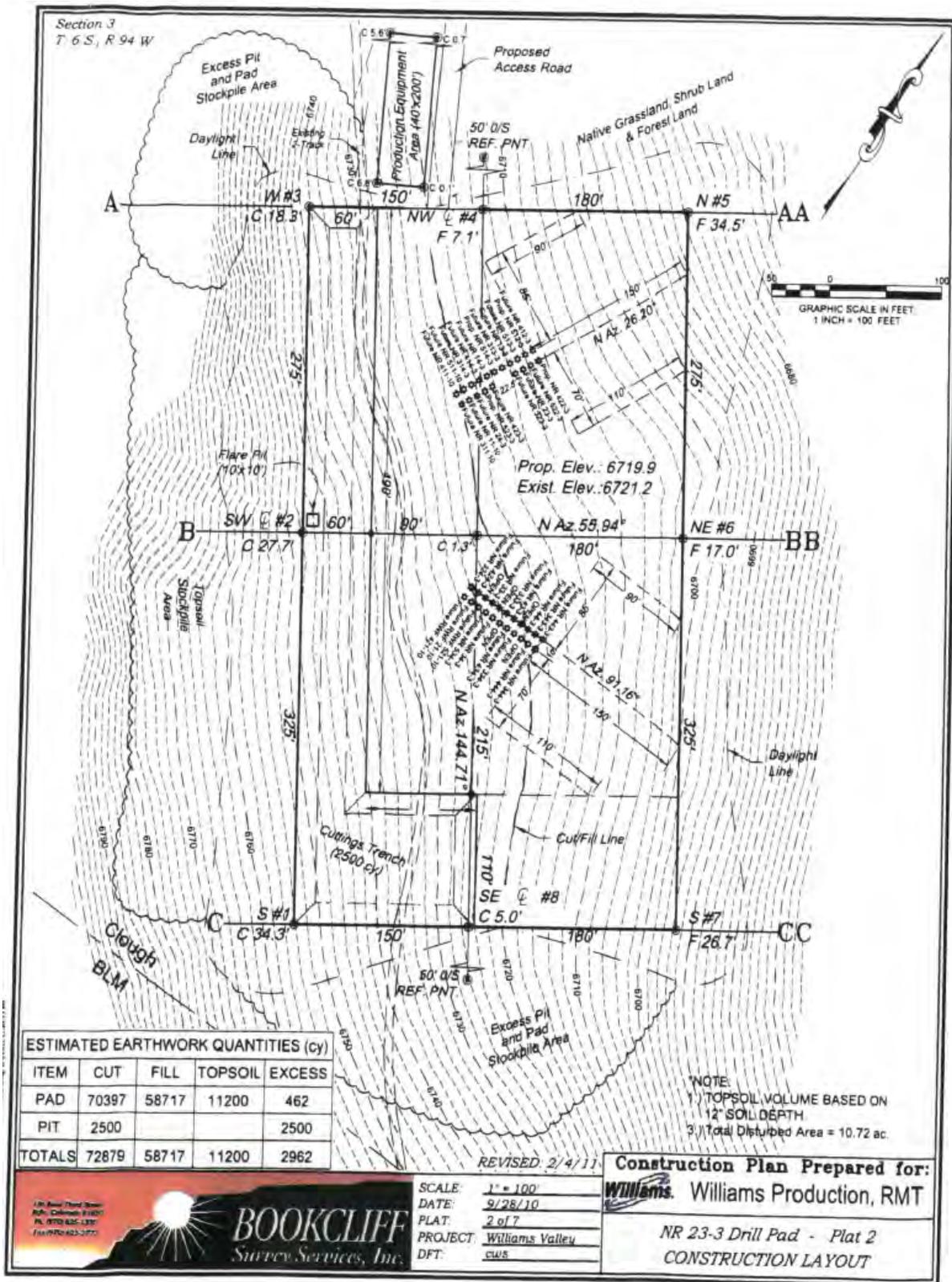


Figure 3. Proposed NR23-3 Pad Layout

The short-term surface disturbance related to the road reconstruction work (which would include the burial of the 12-inch gas line and the 6-inch water line) would amount to 18.7 acres based on an average disturbance corridor width of 75 feet. Approximately 5,950 feet of road reconstruction would occur on BLM, resulting in short-term disturbance of 10.2 acres. After the road and pipeline area completed and reclaimed, the long-term disturbance (based on a road running width of 24 feet) would total 6.0 acres with 3.3 acres occurring on BLM.

North of the NR314-2 pad are six segments (with three segments on BLM) of the pipelines totaling 3,430 feet that would be installed within the old 2-track alignment (Figure 1). The short-term disturbance (using a 50-foot-wide corridor) attributed to this work would amount to 3.9 acres with 2.2 acres on BLM. Additionally, the new gas and water pipelines to be installed along the existing road between the NR314-2 pad and the mainline connection point south of the Golding 4 pad (as shown on Figure 1) would be accomplished with a 15-foot wide disturbance corridor. The length of this “looped” line would be 9,990 feet. The short-term disturbance attributed to this pipeline upgrade would be 3.5 acres.

The planned surface disturbance for the pad would be 10.7 acres. The combined disturbance corridor for the new road and pipelines would average 75 feet amounting to 18.7 acres. The total disturbance for the separate pipeline segments between the NR23-3 pad and the Golding 4 pad would be 9.6 acres. The total short-term disturbance for the project would be 39.0 acres with 12.4 acres of road reconstruction and pipeline installation occurring on public land. After the pad and pipeline are reclaimed, the expected long-term disturbance during the 30-year life of the producing wells would amount to 7.8 acres with 3.3 acres occurring on BLM (Table 2).

Table 2: Disturbance Area (acres)						
<i>Project Component</i>	<i>Private Surface Disturbance</i>		<i>Federal Surface Disturbance</i>		<i>Total Surface Disturbance</i>	
	<i>Short-term</i>	<i>Long-term*</i>	<i>Short-term</i>	<i>Long-term*</i>	<i>Short-term</i>	<i>Long-term*</i>
NR23-3 Pad	10.7	1.8			10.7	1.8
NR23-3 Road with Pipelines	8.5	2.7	10.2	3.3	18.7	6.0
NR23-3 Separate Pipeline Segments	7.4		2.2		9.6	
Project Totals	26.6	4.5	12.4	3.3	39.0	7.8
*Long-term disturbance figures are derived from the unreclaimed working area of the pad and the travel way area of the access road. Since the entire disturbed pipeline corridor is typically reclaimed, no long-term disturbance is attributable to pipelines.						

The Proposed Action would include drilling and completion operations, production of natural gas and associated liquid condensate, proper handling and disposal of produced water, and interim and final reclamation. The Proposed Action would be implemented consistent with Federal oil and gas lease, Federal regulations (43 CFR 3100), and the operational measures included in the Applications for Permit to Drill (APDs). Appendix A lists the specific Surface Use Conditions of Approval that would be implemented as mitigation measures for this project. The operator would be responsible for continuous inspection and maintenance of the access road, pad and pipeline.

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 Federal APDs described in the Proposed Action. Because the operator would have to cross BLM to access the proposed pad on private land, the road improvements and use of the access road would also be denied effectively eliminating the drilling of any Fee wells from the site. No new surface disturbance would occur on public land and, by default, no disturbance on private land would occur under the No Action Alternative.

PURPOSE AND NEED FOR THE ACTION

The purpose of the action is to develop oil and gas resources on Federal leases COC27869 and COC62160 consistent with existing Federal lease rights. The action is needed to increase the development of oil and gas resources for commercial marketing to the public.

SUMMARY OF LEASE STIPULATIONS

The Federal wells would be directionally drilled from the proposed NR23-3 pad located on private surface owned by the Clough family with underlying Fee mineral estate. Because the Federal wells are accessing the nearby Federal leases from a private surface/private mineral location, the Federal lease terms are not applicable to the construction, drilling, completion, or well production operations at the NR23-3 pad or on private land. However, because the existing two-track road would be realigned, reconstructed and upgraded and the pipelines would be buried across public lands to serve not only the planned Federal wells but also the proposed Fee wells, Williams would apply for and obtain a BLM right-of-way (ROW) to construct, use and maintain the road and pipelines. The terms of the Federal leases are applicable to these ROW actions.

Table 3 provides a summary of the applicable Federal lease terms. Appendix A lists site-specific conditions of approval (COAs) developed during the APD/EA review and onsite field consultation that would be attached to the Federal APDs and the related BLM ROWs.

Table 3. Lease Stipulations Applicable to the Proposed Action		
<i>Lease Number</i>	<i>Description of Applicable Lands</i>	<i>Lease Stipulations</i>
COC27869 (1979)	T.6S., R. 94W., Section 2: SWSW; Section 11: N2NW	<p>Timing Limitation: No exploration, drilling or development activity from 1/1 – 5/31 in order to protect important seasonal wildlife habitat. No exploration, drilling or development activity within 0.25 mile of identified raptor nesting areas from 4/1 – 8/31. Exceptions may be granted.</p> <p>Surface Disturbance: The plan of operation must assure adequate protection of drainages, waterbodies, springs, or fish and wildlife habitat, steep slopes or fragile soil. The lessee agrees that during periods of adverse conditions due to the climactic factors such as thawing, heavy rains, or flooding, all activities creating irreparable or extensive</p>

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		<p>damage, as determined by the surface managing agency, will be suspended or the plan of operation modified and agreed upon.</p> <p>Protection of Cultural Resources. The COAs listed in Appendix A identify the updated language for cultural resource protection.</p>
COC62160 (1999)	T.6S., R. 94W., Section 3: E2SE;	<p>Controlled Surface Use: Visual Resource Management (VRM) Class II Areas – protection may include special design requirements, relocation of operations by more than 200 meters, and other measures to retain the overall landscape character.</p> <p>Controlled Surface Use: Erosive Soils and Slopes Greater than 30 % -- to protect erosive soils and slopes greater than 30%, special design, construction and implementation measures will be required to limit the amount of surface disturbance, to reduce erosion potential, to maintain site stability and productivity, and to ensure successful reclamation.</p> <p>Timing Limitation: Big Game Winter Habitat (12/1 - 4/30). Exception may be granted under mild winter conditions for the last 60 days after consultation with CDOW.</p> <p>No Surface Occupancy: To protect wildlife seclusion areas (areas of high wildlife value). Exceptions may be granted if a mitigation plan that suitably addresses the wildlife seclusion values at risk is approved by BLM.</p> <p>No Surface Occupancy: No surface use is allowed on steep slopes greater than 50% to maintain site stability and site productivity. This NSO does not apply to pipelines. Exception may be granted if lessee demonstrates that operations can be conducted without causing unacceptable impacts and that less restrictive measures will protect the public interest.</p> <p>No Surface Occupancy: To protect slopes over 30% with high visual sensitivity in the I-70 viewshed. Exceptions would be granted if protective measures can be designed to accomplish VRM Class II objectives, namely that the overall landscape character would be retained. Such measures would be designed to blend the disturbance in with the natural landscape.</p>

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.”

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 Geographic Area Plans (GAPs) for lease development over a large geographic area. However, the 1999 RMP amendment also provides exceptions to that requirement for individual or small groups of exploratory wells drilled in relatively undrilled areas outside known high production areas. The Proposed Action, as such, is in conformance with the exception to the requirement to require operators to submit Master Development Plans (MDPs), previously known as Geographic Area Plans (GAPs).

STANDARDS FOR PUBLIC LAND HEALTH

In January 1997, Colorado BLM approved the Standards for Public Land Health. The five standards cover upland soils, riparian systems, plant and animal communities, threatened and endangered species, and water quality. Standards describe conditions needed to sustain public land health and relate to all uses of the public lands. The environmental analysis must address whether impacts resulting from the Proposed Action or alternatives being analyzed would maintain, improve, or deteriorate land health conditions relative to these resources. These analyses are conducted in relation to baseline conditions described in land health assessments (LHAs) completed by the BLM. The Proposed Action would be located in an area that was included in the Rifle-West Watershed LHA (BLM 2005).

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 Management
Air Quality	Realty Authorizations
Cultural Resources	Socio-Economics
Paleontological Resources	Soils
Fossil Resources	Special Status Species
Geology and Minerals	Vegetation
Invasive Non-Native Plants	Visual Resources
Migratory Birds	Wastes, Hazardous and Solid
Native American Religious Concerns	Water Quality, Surface and Ground
Noise	Wildlife, Aquatic and Terrestrial

Access and Transportation

Affected Environment

The project area is accessed from I-70, West Rifle Exit by traveling north 500 feet from the I-70 interchange to the Clough property access road, then traveling another 3 miles north on the private access road to the NR314-2 pad. The proposed road reconstruction segment begins at the NR314-2 pad and ends at the proposed NR23-3 pad in Section 3.

Environmental Consequences

Proposed Action

The 2.1 miles of reconstructed access road, along with the new buried gas and water pipelines, would create a 75-foot-wide disturbance corridor; the new surface disturbance for this corridor would amount to 18.7 acres. After burial of the pipelines and reclamation of the road cuts and fills, the long-term disturbance for the reconstructed road would total 6.0 acres. The amount of actual road disturbance on BLM land would be 10.2 acres (short-term) and 3.3 acres (long-term) for the road running surface and road ditch (Table 2).

The Proposed Action would result in a substantial increase in truck traffic related to the development of the 37 wells between 2001 and 2013. 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

This alternative would not have an impact on access or transportation, because the development activities would not occur.

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), ozone (O₃), particulate matter less than 10 microns (µ) in diameter (PM₁₀) and less than 2.5 µ in diameter (PM_{2.5}), and sulfur dioxide (SO₂).

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.

Table 5. Air Pollutant Background Concentrations, Colorado and National Ambient Air Quality Standards, and Prevention of Significant Deterioration (PSD Increments)					
Pollutant/Averaging Time		Measured Background Concentration	Colorado and/or National AAQS	Incremental Increase Above Legal Baseline PSD Class I/ II	
Carbon Monoxide (CO) ¹	1-hour	1,160 µg/m ³	40,000 µg/m ³ (35 ppm)	n/a	n/a
	8-hour	1,160 µg/m ³	10,000 µg/m ³ (9 ppm)	n/a	n/a
Nitrogen Dioxide (NO ₂) ²	Annual	10 µg/m ³	100 µg/m ³ (0.053 ppm)	2.5 µg/m ³	25 µg/m ³
Ozone ³	8-hour	149 µg/m ³ (highest)	147 µg/m ³ (0.075 ppm)	n/a	n/a
Particulate Matter (PM ₁₀) ¹	24-hour	114 µg/m ³ (highest)	150 µg/m ³	8 µg/m ³	30 µg/m ³
Particulate Matter (PM _{2.5}) ⁴	24-hour	40 µg/m ³ (highest)	35 µg/m ³	n/a	n/a
	Annual	11.2 µg/m ³	15 µg/m ³	n/a	n/a
Sulfur Dioxide (SO ₂) ⁵	3-hour	24 µg/m ³	1,300 µg/m ³ (0.5 ppm)	25 µg/m ³	512 µg/m ³
	24-hour	13 µg/m ³	365 µg/m ³ (0.14 ppm)	5 µg/m ³	91 µg/m ³
	Annual	5 µg/m ³	80 µg/m ³ (0.03 ppm)	2 µg/m ³	20 µg/m ³

¹ Background data collected in Rifle, 2008; highest levels recorded in April (Air Resource Specialists 2009).
² Background data collected by EnCana at site north of Parachute, 2007 (CDPHE 2008).
³ Background data collected in Rifle, 2008; highest levels recorded in July (Air Resource Specialists 2009).
⁴ Background data collected in Rifle, September - December 2008; highest levels recorded in December (Air Resource Specialists 2009).
⁵ Background data collected at Unocal site, 1983-1984 (CDPHE 2008).

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.

The surrounding areas are classified as PSD Class II. The PSD Class I areas within 100 miles of the project area are the Flat Tops Wilderness (45 miles NE), Maroon Bells–Snowmass Wilderness (50 miles

SE), West Elk Wilderness (60 miles SE), Black Canyon of the Gunnison National Park (45 miles S), Eagles Nest Wilderness (90 miles E), and Arches National Park (65 miles SW). Dinosaur National Monument (55 miles NW) is listed as a Federal Class II area, but is regulated as a Class I area for SO₂ by CDPHE. These sensitive areas have the potential to be impacted by cumulative project source emissions. Regional background pollutant concentrations and NAAQS, CAAQS, and PSD Class I and II increments are also presented in Table 5.

Environmental Consequences

Proposed Action

CDPHE, under its EPA-approved State Implementation Plan (SIP), 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. Therefore, 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.

Air quality would decrease during construction of the NR23-3 pad, roadwork, wells, and pipelines. Pollutants generated during these activities would include combustion emissions and fugitive dust associated with construction equipment and vehicles. Construction activities would occur between 7:00 a.m. and 6:00 p.m. each day for a period of approximately two weeks. Construction of the road, pad, and pipeline would take up to 6 weeks; much of this construction would occur concurrently. Once construction activities are complete, air quality impacts associated with these activities would also cease.

Volatile organic compound (VOC) emissions are dependent on the characteristics of the condensate, tank operations, and production. The air impacts associated with the condensate tanks are anticipated to be minor, but VOC emissions would be controlled as required under CDPHE Regulation 7. If deemed necessary by the State, Williams may need to install a vapor recovery or thermal destruction system to reduce VOC concentrations.

The Roan Plateau RMPA and EIS describe potential effects from oil and gas development (BLM 2006:4-26 to 4-37). Analysis was completed with regard to greenhouse gas emissions, a near-field and far-field analysis for "criteria pollutants" (particulate matter [PM₁₀ and PM_{2.5}], carbon monoxide, sulfur dioxide, and nitrogen oxides) and hazardous air pollutants (benzene, ethylbenzene, formaldehyde, hydrogen sulfide, toluene, and xylenes). Sulfur and nitrogen deposition, acid neutralizing capacity, and a visibility screening analysis were also completed in the Roan Plateau RMPA and EIS. Because the visibility screening analysis showed potential impacts at one or more Class I areas, a refined visibility analysis was also completed. The refined visibility analysis indicated a "just noticeable" impact on visibility for one day each at two Class I areas (Black Canyon of the Gunnison National Park and the Mt. Zirkel Wilderness). For the other pollutants analyzed, the implementation of oil and gas development under the Roan Plateau RMPA and EIS would have either no or negligible long-term adverse impacts on air quality.

At present, the CRVFO has approved fewer APDs than the number used in air quality modeling for the Roan Plateau RMPA/EIS, although that number (1,582) is being approached and may be reached in Fiscal Year 2011. The BLM does not consider 1,582 wells to represent a cap on the number of APDs that can be approved pursuant to the Roan air modeling but instead views that number as an assumption used in developing inputs to the model, just as several other assumptions were used as inputs. However, to

ensure that the number of new wells analyzed under the Roan modeling is not exceeded, the CRVFO is currently approving only time-critical APDs and deferring approval of other APDs until publication of a new air quality model recently completed in conjunction with an RMP revision currently underway.

To mitigate dust generated by construction and vehicular travel on unpaved access roads, the operator would be required to implement dust abatement strategies as needed by watering the access road and construction areas and/or by applying a surfactant approved by the Authorized Officer (Appendix A). Additionally, the operator would be required to apply gravel to the access road to a compacted depth of 6 inches, further reducing fugitive dust emissions (Appendix A).

Since the current land use plan was approved, 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 (2007) 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” (National Academy of Sciences 2007). Other theories about the effect of GHGs on global climate change exist.

The assessment of GHG emissions and climate change remains in its formative phase. Therefore, it is not yet possible to know with certainty the net impact to climate from GHGs produced globally over the last century or from those produced today. 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 the No Action Alternative, the project components included in the Proposed Action would not be approved and constructed. Therefore, emissions of pollutants from vehicle and equipment engines or of fugitive dust from disturbed surfaces that would accompany the Proposed Action would not occur.

Cultural Resources (Archaeology)

Affected Environment

Nine Class III cultural resource investigations (intensive pedestrian inventories) identified as CRVFO# 1107-19, 1111-3, 16809-1, 1105-14, 1102-4, 9801-1, 8396-1a&b, 664, and 602 have been conducted in the proposed NR23-3 well pad and pipeline project vicinity. Four “isolated finds” are identified as being located within the project area. Isolated finds are by definition not eligible to the National Register of Historic Properties (NRHP). No “historic properties” were identified in the area of potential disturbance

for this project. “Historic properties” are cultural resources that are eligible or potentially eligible for inclusion on the NRHP.

Environmental Consequences

Proposed Action

The implementation of the Proposed Action would have no direct impacts to known “historic properties” as none are in any of the areas of proposed ground disturbance. Therefore, 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 (16U.S.C 470f), the BLM/State Historic Preservation Officer (SHPO) Programmatic Agreement (1997) and Colorado Protocol (1998)]. As the BLM has determined that the Proposed Action would have no direct impacts to known “historic properties,” no formal consultation was initiated with the SHPO.

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 location. These impacts could range from illegal collection and excavation to vandalism.

A standard Education/Discovery COA for cultural resource protection would be attached to the APD(s) (Appendix A). The importance of this COA should be stressed to the operator and its contractors, including informing them of their responsibilities to protect and report any cultural resources encountered during construction, drilling, completion, and maintenance operations.

No Action Alternative

The No Action Alternative constitutes denial of the Federal APDs described in the Proposed Action and any of the associated upgrades to the pad, road, and pipeline. No new surface disturbance on private or public land would occur under the No Action Alternative.

Fossil Resources (Paleontology)

Affected Environment

The current classification system utilized by the BLM for assessing impacts to fossil resources is the Potential Fossil Yield Classification System (PFYC). This system classifies geologic units based on the relative abundance of vertebrate fossils or scientifically important invertebrate and plant fossils and their sensitivity to adverse impacts. This classification is applied to a geologic formation, member, or other distinguishable unit. This classification system recognizes that although significant fossil localities may occasionally occur in a geologic unit, a few widely spaced localities do not necessarily indicate a higher class. The primary purpose of the PFYC is to assess the possible impacts from surface disturbing activities and help determine the need for pre-disturbance surveys and monitoring during construction.

The predominant surface formation found within the proposed development, as well as the area directly underlying the proposed well pad is the Tertiary Wasatch Formation (Two). The Wasatch Formation, also known as the DeBeque Formation in this part of the Piceance Basin, is ranked under the PFYC system as a Class 4/5 formation. The Wasatch Formation is mapped extensively within the proposed development area. The probability of finding fossils within the Wasatch Formation is rated *high* and *very high*, respectively. In Class 4 units, vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur, but may vary in occurrence and predictability. Class 5 units predictably and

consistently produce significant fossils. Although the Wasatch Formation is ranked high under the PFYC system, 4 and 5 out of 5 classes, lack of bedrock exposure lowers the risk of human-caused adverse impacts and natural degradation within the proposed new well pad area.

The Wasatch Formation is divided into the early Eocene Shire Member and the Paleocene Molina and Atwell Gulch Members. 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).

A paleontological survey of the proposed access road alignment and NR23-3 well pad was performed by Uinta Paleontological Associates, Inc. in July 2010. The proposed well pad will be located on private surface. Greater focus was given to the existing two-track that will be upgraded into the new access. The survey revealed some bedrock exposed within the access corridor traversed by the new road. Four areas of exposed sandstone were recorded along the proposed access road alignment, but did not yield fossil specimens. The area is covered with colluvium approximately 1 to 1.5 meters thick, a thick soil layer, and dense vegetation.

Environmental Consequences

Proposed Action

The paleontological survey was initiated due to the predominance of surface exposure of the Wasatch Formation within the development area, and the presence of numerous fossil discovery sites recorded within close proximity. The closest documented fossil discovery site is found approximately 1,800 feet southwest of the proposed pad site in NE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 10, T6S, R94W. Three additional sites are found approximately 4,000 feet west in Section 4, with a greater number of recorded sites in both Sections 8 and 9, T6S, R94W. The scarcity of fossil occurrence during the pre-construction survey is attributed to poor bedrock exposures, but Tertiary Wasatch bedrock will be impacted and excavation of these exposures will occur during access road construction. It is recommended that spot monitoring of these exposures occur during the excavation of the access road only. If a discovery is made, once it is evaluated, construction work should be allowed to proceed beyond the discovery to prevent construction delays. The standard paleontological COA would be attached to the APDs. (Appendix A).

No Action Alternative

Under the No Action Alternative, the NR23-3 well pad, road and associated facilities would not be constructed. No new impacts to paleontological resources would occur.

Geology and Minerals

Affected Environment

The development area is located near the eastern margin of the Colorado Plateau physiographic province (Fenneman 1946), a region characterized by dissected plateaus of strong relief. Elevations range from approximately 5,900 feet on the NR314-2 well pad to approximately 6,800 feet on the proposed NR23-3 well pad. 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 area proposed for the NR23-3 well pad and accompanying facilities.

The Mesaverde Group is the target zone of the proposed drilling program. Made up 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>
Qa	Quaternary alluvium deposits	Holocene	Chiefly silt, sand, and gravel	Flood plains, fans, and low terraces
Qc	Quaternary colluvial deposits	Holocene	Earthflow, mudflow, landslide, and talus deposits	Stream valleys
Qg	Quaternary gravels	Holocene	Young gravels, (Bull Lake and younger) – stream, terrace, and outwash gravels	Streams, flood plains and fans
Tu	Uinta Formation	Eocene	Siltstone, sandstone and marlstone	Top of Mamm Peak
Tgl	Lower part of Green River Formation	Eocene	Shale, sandstone, and marlstone	Roan cliffs
Tgp	Parachute Creek Member of Green River Fm	Eocene	Gray and yellow-brown marlstone and tuff and Mahogany oil shale bed	Roan cliffs
Two	Wasatch Formation	Eocene, Paleocene	Red, gray and brown sandstone and siltstone and red, green and gray shale	Base of Battlement Mesa and predominant surface exposures both north and south of the Colorado River

Source: Tweto et al. 1978, Ellis and Freeman 1984, Shroba 1997.

Production is derived from three reservoir intervals, which include the Wasatch Formation, the 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 1988), creating an interbedded relationship between source and reservoir. The trapping mechanism of the gas is both stratigraphic and diagenetic.

Environmental Consequences

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 or “fracing” will 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, 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 the No Action Alternative, the Federal wells and associated facilities would not be approved. As a result, no new impacts to the geology and mineral resources on the Federal mineral estate would occur.

Invasive Non-Native Plants

Affected Environment

The area is relatively free of invasive non-native species with the exception of a low density of cheatgrass (*Anisantha tectorum*) found throughout the project area.

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 invasive, non-native species are present in the project area, the potential for invasion following construction activities is moderate. Mitigation measures designed to minimize the spread of these species would be attached to well APDs as COAs (see Appendix A).

No Action Alternative

Under the No Action Alternative, none of the proposed ground disturbance on private or public land would occur so the potential for weed invasion would be considerably less than under the Proposed Action; however, invasive non-native species already present in the project area would spread if left untreated.

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 and able to feed across a larger area and wider range of habitats.

Numerous migratory bird species occupy, or have the potential to occupy, the project area. 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 more than 100 Birds of Conservation Concern (BCC) that deserve 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.

Species on the BCC list that are potentially present in the project area, based on habitat preferences and known geographic ranges, include the flammulated owl (*Otus flammeolus*), Lewis's woodpecker (*Melanerpes lewis*), pinyon jay (*Gymnorhinus cyanocephalus*), juniper titmouse (*Baeolophus griseus*), Brewer's sparrow (*Spizella breweri*), and Cassin's finch (*Carpodacus cassinii*). The flammulated owl and Brewer's sparrow are also listed as BLM sensitive species and are therefore addressed in the section on Special Status Wildlife and Fish. The potential for occurrence of Lewis's woodpecker is low due to its close association with riparian woodlands and to pinyon-juniper habitats with a component of ponderosa pine—neither of which is a major habitat type within the project vicinity.

Among the other BCC species listed above, the pinyon jay and juniper titmouse are almost totally associated with extensive stands of pinyon pine (*Pinus edulis*) and junipers (Rocky Mountain juniper [*Juniperus scopulorum*] and Utah juniper [*J. utahensis*]), which are not prevalent in the project area but extensive in the project vicinity. Cassin's finch nests at higher elevations, primarily in ponderosa pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziesii*), or mixed stands of Engelmann spruce (*Picea engelmannii*) and subalpine fir (*Abies latifolium*). However, Cassin's finches often disperse to lower elevations following the breeding season and may remain there until the following spring. Mixed mountain shrub habitats containing large, tree-like Gambel's oaks (*Quercus gambeli*) are among the vegetation types sometimes supporting winter use by Cassin's finch.

Non-BCC species likely to occur in the project area or vicinity include several Neotropical migrants associated with mixed mountain shrub habitats. These include the common nighthawk (*Chordeiles minor*) (not a raptor), common poorwill (*Phalaenoptilus nuttallii*), broad-tailed hummingbird (*Selasphorus platycercus*), dusky flycatcher (*Empidonax oberholseri*), western scrub-jay (*Aphelocoma californica*), Virginia's warbler (*Oreothlypis virginiae*), orange-crowned warbler (*O. celata*), MacGillivray's warbler (*Oporornis tolmiei*), lazuli bunting (*Passerina amoena*), lesser goldfinch (*Spinus psaltria*), black-headed grosbeak (*Pheucticus melanocephalus*), and spotted towhee (*Pipilo maculata*). The western wood-pewee (*Contopus sordidulus*), cordilleran flycatcher (*Empidonax difficilis*), warbling vireo (*Vireo gilvus*), Bullock's oriole (*Icterus bullockii*), and blue grosbeak (*Passerina caerulea*) are associated primarily with trees but may occur in mixed mountain shrub habitats containing tree-form Gambel's oaks or species protruding above shrub layer.

Non-BCC species likely to occur in the pinyon-juniper within the project area or venturing into the area from more extensive habitats nearby include Neotropical migrants such as the black-chinned hummingbird (*Archilochus alexandri*), western kingbird (*Tyrannus verticalis*), Say's phoebe (*Sayornis saya*), mountain bluebird (*Sialis currucoides*), western bluebird (*S. mexicana*), plumbeous vireo (*V. plumbeus*), black-throated gray warbler (*Dendroica nigrescens*), and chipping sparrow (*Spizella passerina*). Two other Neotropical migrants, the ash-throated flycatcher (*Myiarchus cinerascens*) and gray flycatcher (*Empidonax wrightii*) are potentially present, although the project area is at the eastern edge of their range.

Raptors use the project area for nesting and hunting activities. Nesting habitat is primarily found in the pinyon-juniper woodlands of the project vicinity. 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*).

Two surveys were conducted for biological resources including raptors and their nests. The 2010 survey of the access road, gas pipeline and proposed pad area found no active nests in the project area. A subsequent survey conducted in spring 2011 of the gas and water pipelines from the NR314-2 pad south to the Golding 4 pad and the main pipeline connection found two inactive nests.

Environmental Consequences

Proposed Action

Direct impacts to migratory birds from the Proposed Action include the loss/fragmentation of approximately 39 acres of foraging/hunting and nesting habitat. Removal of pinyon-juniper woodlands, sagebrush and mixed mountain shrub species would result in a loss of existing and potential nesting sites. Loss of habitat and impacts on populations would be more severe for High-Priority species or Birds of Conservation Concern. Reclamation activities resulting in the growth of herbaceous species would increase habitat for small rodents, and therefore, increase prey species for raptors. While habitat loss/fragmentation may affect individual birds, it is not expected to adversely impact a species as a whole.

If construction, drilling or completion activities occur during the spring/summer season, visual and noise disturbance near active nests could cause nest failure or nest abandonment and subsequently, a reduction in productivity. Construction activity during the nesting season could also result in the destruction of clutches and/or mortality of nestlings/fledglings.

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.

Therefore, as a result of the raptor survey, a 60-day timing limitation (TL) from May 1 through June 30 would be applied as a COA to any activities authorized pursuant to this EA. The TL would be applied to prohibit any vegetation removal as a means of reducing adverse impacts to other migratory birds such as BCC species. Appendix A provides details of this COA and describes potential bases for the granting of an exception to the TL.

No Action Alternative

The No Action Alternative constitutes denial of the Federal APDs described in the Proposed Action and any of the associated upgrades to the pad, road, and pipeline. No new surface disturbance on private land or public land would occur under the No Action Alternative, thus eliminating impacts from this development to migratory birds.

Native American Religious Concerns

Affected Environment

The proposed NR23-3 pad project location 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. No sensitive areas were identified during the inventories and none are currently known in the 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 Ute Tribe of the Uintah and Ouray Bands, the primary Native American tribe in this area of the CRVFO, have indicated that they do not wish to be consulted for small projects or projects where no Native American areas of concern have been identified either through survey or past consultations. Therefore, formal consultation was not undertaken. 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 in the vicinity of the proposed project could indirectly impact unknown Native American resources ranging from illegal collection to vandalism.

The National Historic Preservation Act (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. Williams 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

The No Action Alternative constitutes denial of the Federal APDs described in the Proposed Action and any of the associated upgrades to the pad, road and pipeline. No new surface disturbance on private or public land would occur under the No Action Alternative.

Noise

Affected Environment

The Proposed Action would lie within a rural setting approximately 3 miles north of I-70. The closest residence would be 2 miles south of the project area. Noise levels in the project area are presently created by traffic serving the existing nearby well pads in the East Webster Mesa area.

Environmental Consequences

Proposed Action

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

location. Drilling activities are subject to noise abatement procedures as defined in the Colorado Oil and Gas Conservation Commission Rules and Regulations (Aesthetic & Noise Control Regulations), generally a limit of 80 decibels dBA during the day and 75 dBA at night, measured at a distance of 350 feet. 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.

Short-term (7- to 14-day) increases in noise levels would characterize road and well pad construction. Based on the Inverse Square Law of Noise Propagation (Harris 1991) and an average construction site noise level of 67 dBA at 500 feet (Table 7), construction noise would equal approximately 59 dBA at 1,000 feet. At 1,000 feet, noise levels would approximate those of an active commercial area (EPA 1974).

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 dBA at 500 feet, actions associated with drilling and completion would generate approximately 62 dBA 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. As stated above, the nearest residence is 0.5 mile away.

Table 7. Noise Levels at Typical Construction Sites and along 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)			

Traffic noise levels 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 7, approximately 68 dB(A) 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. These levels would be less than during the construction phase but would remain above background noise levels. During maintenance and workovers, noise levels would increase above those associated with routine well production. Traffic

noise level would impact residences located along county roads that provide primary access into the area. While exposure to these noise levels is not likely to be harmful, it is likely to be annoying to residents.

No Action Alternative

Under the No Action Alternative, the project components included in the Proposed Action would not be approved and constructed. Therefore, no noise impacts would accompany this alternative.

Range Management

Affected Environment

The project area lies within the boundaries of the Webster Park Allotment. Table 8 summarizes the permitted grazing use on the allotment.

Table 8. Project Area Grazing Allotment.					
<i>Allotment</i>	<i>Authorization Number</i>	<i>Livestock Type and Number</i>	<i>Season of Use</i>	<i>% PL</i>	<i>AUMs</i>
Webster Park # 18902	0503994	1,000 Sheep	4/5 to 6/15	20	95
		1,000 Sheep	11/1 to 11/30	20	39

Environmental Consequences

Proposed Action

Oil and gas development within the project area would result in approximately 39.0 acres of total short-term surface disturbance. This disturbance and resulting loss of vegetation would last for approximately three to five years or until grasses and forbs seeded during interim reclamation became productive.

Rehabilitation of the short-term disturbance areas would replace some of the livestock forage. Long-term vegetative loss from the working areas of well pads and roadways, amounting to 7.8 acres, would be expected to last 20 to 30 years until the wells lost their productivity. With final reclamation of the wells sites and access roads, the full productivity of the rangeland would be reestablished.

Production of grasses and forbs on successfully rehabilitated sites is often greater than on those sites prior to disturbance, which would mitigate some of the initial loss of forage. Since the gas development would take place over time, the reduction in available livestock forage at any one time would be less than the total reduction in forage if the Proposed Action were to be implemented all at once.

Additional effects from oil and gas development on livestock grazing could include increased human activity, spread of noxious weeds, and livestock mortality as a result of collisions with vehicles. Biological stress could be induced on the grazing cattle from the increased development activities and result in changes in use patterns and trailing routes.

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 cover. Improvement in livestock distribution could improve forage utilization throughout the allotment.

Effects from increased human activity also could include the introduction and spread of noxious weeds and the subsequent degradation of rangeland health. The section on Invasive Non-native Species describes in detail the effects of invasive species and lists mitigation measures related to the Proposed Action.

The BLM does not anticipate that impacts from implementation of the Proposed Action would require adjustment of the livestock stocking rate. 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, pipelines, etc.) would be avoided during development of oil and 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. (Appendix A).

No Action Alternative

Under the No Action Alternative, there would be no additional developments occurring on private and public land that would affect the Federal grazing program.

Realty Authorizations

Affected Environment

Aside from the two Federal oil and gas leases (COC27869 and COC62160) listed in Table 3, no existing realty authorizations occur in the immediate vicinity of the project area. The Federal leases give Williams the right to explore and develop the Federal fluid minerals. There are components of the Proposed Action which would require Realty Authorizations by the BLM.

Environmental Consequences

Proposed Action

The two Federal mineral leases represent the only existing realty authorizations in the project vicinity. The leases authorize oil and gas development which is the objective of the Proposed Action. To access the proposed NR23-3 pad on private land and drill the three exploratory Fee wells, Williams would apply to the BLM for rights-of-way grants to authorize reconstruction, use, and maintenance of the NR23-3 access road and install the gas and water pipelines to move private gas across public land. Mitigation measures specific to the BLM rights-of-way are listed in Appendix A.

No Action Alternative

No new developments would occur which would adversely affect the terms of the existing Federal oil and gas leases (COC27869 and COC62160). No new realty authorizations would be necessary.

Socio-Economics

Affected Environment

The project area is located within Garfield County, Colorado. The population of Garfield County grew by an average of approximately 3% per year from 2000 to 2005, resulting in an increase from 44,236 to

50,379 residents (DOLA 2010). Population growth in Garfield County is expected to more than double over the next 20 years from over 50,000 in 2005 to 106,549 in 2025 (DOLA 2010).

In the year 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).

Personal income in Garfield County has also risen, growing from \$504 million in 1990 to \$2.2 billion in 2008 (U.S. Department of Commerce 2008). Annual per capita income has grown in the same period; from about \$19,354 to \$40,166 (U.S. Department of Commerce 2008), and the average earnings per job in 2005 was approximately \$37,500 (Garfield County 2007). The communities of Parachute, Silt, and Rifle are considered the most affordable for housing; the communities of Battlement Mesa, New Castle, and Glenwood Springs the least affordable where the cost to rent or own similar housing may be 50% or more (BLM 2006).

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 have been estimated to be as much as \$1 million annually, with perhaps an additional \$1 million annually of indirect and local expenditures (CDOW 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). Gas production in Garfield County has increased tremendously during the past nine years from 70,309,038 (MCF) in 2000 to 575,697,025 (MCF) in 2009 (COGCC 2010). In addition, Garfield County is experiencing the fastest 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 Federal government makes "Payments in Lieu of Taxes" (PILT) to County governments to help offset property tax revenue lost of nontaxable Federal lands within County boundaries (BLM 2006). Payments are based on Federal acreage in the County for all land management agencies, including BLM, U.S. Forest Service (USFS), U.S. Fish and Wildlife Service (USFWS), and National Park Service (NPS). The amount may also be adjusted based on population and as appropriated by Congress. By formula, payments are decreased as other Federal funds, such as mineral royalty payments, increase. PILT received by Garfield County in the last five years has been as follows: \$808,348 in 2005; \$1,065,158 in 2006; \$1,078,087 in 2007; and \$1,078,521 in 2008; \$1,808,984 in 2009 (USDI 2010).

In addition to PILT payments, BLM shares revenue generated by commercial activities on public lands with State and County governments (BLM 2006). Federal mineral royalties are levied on oil and gas production from Federal mineral leases. Oil and gas lessees pay royalties equal to 12.5% of the wellhead

value of oil and gas produced from public land. Half the royalty receipts are distributed to Colorado, and the amount distributed to Garfield County in 2002 attributable to oil and gas production was \$14.1 million. In 2001, the amount was \$5.5 million (BLM 2006). These funds are then allocated to fund County services, schools, and local communities.

Property tax revenue from oil and gas development has also become the largest source of public revenue in Garfield County (BLM 2006). In the year 2009, oil and gas assessed valuation in Garfield County amounted to approximately \$3.8 billion, or about 74% of total assessed value. Total tax revenues from property taxes and special district levies were \$130 million. Tax dollar distributions in 2009 were Schools 30.4%, County 32.3%, Special Districts 14.3%, Fire Districts 12.3%, Colleges 8.9%, and Towns 1.7% (Garfield County 2009).

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 2000, 16.7% of the residents of Garfield County identified themselves as Hispanic or Latino, and this is consistent across the State (17.1%). African Americans, American Indians, and Pacific Islanders account for less than 1% of the Garfield County population, which is below the State levels (Garfield County 2000).

Environmental Consequences

Proposed Action

The Proposed Action would positively impact the local economies of Garfield County through the 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 the potential displacement of big game and resulting reduction in big game hunting within the project area.

The Proposed Action could result in minor negative social impacts, including (1) decrease in the recreational character of the area, (2) reduced scenic quality, (3) increased dust levels, and (4) increased traffic. However, most of these impacts would be minor and limited to the relatively short duration of drilling and completion activities.

Environmental Consequences

Proposed Action

The Proposed Action would positively impact the local economies of Garfield County through the creation of additional 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 the potential displacement of big game and resulting reduction in big game hunting within the project area.

The Proposed Action could result in minor negative social impacts including (1) a negligible decrease in the recreational character of the area (see Recreation); (2) reduced scenic quality (see Visual Resources); (3) increased dust levels, especially during construction (see Air Quality); and (4) increased traffic (see Transportation).

No Action Alternative

The No Action Alternative would result in no additional impacts to socio-economics of the general area.

Soils (includes an analysis of Public Land Health Standard 1)

Affected Environment

According to the *Soil Survey of Rifle Area, Colorado* (USDA 1985), the Proposed Activities would be located on two soil complexes. The well pad would be constructed on the Potts-Ildefonso complex. This deep, well-drained soil is found on mesas, alluvial fans, and sides of valleys at elevations from 5,000 to 6,500 feet and slopes of 12 to 25 percent. This soil is derived from sandstone, shale, or basalt, with small amounts of aeolian material. Surface runoff is medium, and erosion hazard is moderate. Primary uses for these soils are limited grazing and wildlife habitat.

The southeastern corner of the proposed pad and the access road would be located on the Ildefonso stony loam unit. This deep, well-drained, hilly soil is also found on mesas, sides of valleys, and alluvial fans at elevations from 5,000 to 6,500 feet and on slopes of 25 to 45 percent. This soil is derived primarily from basalt and may contain a small amount of aeolian material at the top of the unit. Surface runoff for this soil is medium and erosion hazard is severe. Primary uses for this soil include grazing and wildlife habitat.

Environmental Consequences

Proposed Action

The area generally contains adequate vegetation buffers that would minimize the potential for sediment transport. However, construction activities would cause slight to moderate increases in local soil loss, loss of soil productivity, and sediment available for transport to surface waters. 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 drainages.

The proposed pad would be located on soils with moderate risk of erosion or slope instability while the access road and pipelines would be installed on soils with severe erosion hazards. Throughout the affected area, the potential would also exist for accidental spills or leaks of petroleum products and hazardous materials during construction. These events would cause soil contamination and may decrease the soil fertility and revegetation potential. Long-term soil protection could be achieved by continued maintenance to reduce erosion, remediate soil contamination, and minimizing the size of the pad footprint through interim reclamation. Such impacts should be adequately mitigated by proper utilization of BMPs and the standard and site-specific COAs. Following interim reclamation, it would be the responsibility of the operator to continue revegetation/reclamation efforts until vegetative communities on disturbed surfaces are composed of seeded or other desirable vegetation, as determined by the BLM. Appropriate revegetation is important to prevent or minimize soil erosion and infestation of weeds.

Total short-term disturbance related to the Proposed Action would amount to 39.0 acres with the long-term disturbance after site reclamation and successful revegetation amounting to 7.8 acres.

No Action Alternative

The No Action Alternative would have no bearing on Standard 1 because no development activities would occur.

Analysis on Public Land Health Standard 1 for Upland Soils

The Proposed Action with associated mitigation is unlikely prevent Standard 1 from being achieved.

Special Status Species

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

The results of a plant survey conducted in July 2010 indicate that there are no Federally listed, proposed, or candidate plant species or suitable habitat for these species in the project area. Therefore, the Proposed Action would have “**No Effect**” on these species.

No Action Alternative

The No Action Alternative would not cause impacts to any Federally listed, proposed, or candidate plants because these species do not occur in the area to be affected.

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 U.S. Forest Service (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 GSFO. 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 GSFO 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.

Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*). Candidate for Federal listing. This secretive species occurs in mature riparian forests of cottonwoods and other large deciduous trees with a well-developed understory of tall riparian shrubs. Riparian areas in the project area do not provide suitable habitat for this species. It also is not known to occur in the cottonwood corridor along the Colorado River a few miles north of the project area; occurrence there is unlikely due to the patchy nature of the stands and the general lack of a tall-shrub understory. 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. This portion of the Colorado River lies a few miles north of the project area. The nearest known habitat for the humpback chub and bonytail is within the Colorado River approximately 70 miles downstream from the project area. Occasionally, the bonytail is 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 east 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 GSFO and WRNF areas is apparently the result of human intervention (e.g., sanctioned or *ad hoc* translocation 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 BLM’s 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 to use 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.

No Action Alternative

The No Action Alternative constitutes denial of the Federal APDs described in the Proposed Action and any of the associated upgrades to the pad, road and pipeline. No new surface disturbance on private or public land would occur under the No Action Alternative, thus eliminating impacts from this development to Federally listed, proposed, or candidate animal species.

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

A plant survey conducted in July 2010 indicated there are no BLM sensitive plant species or their habitats in the vicinity of the Proposed Action.

No Action Alternative

Since no BLM sensitive plant species occur in the project area, no impacts to these species are anticipated.

BLM Sensitive Animal Species

Affected Environment

BLM sensitive animal species with habitat and/or occurrence records in the portion of the CRVFO that includes the project area and vicinity are listed in Table 9.

Table 9. 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	Predominantly uses spruce/fir forests but also use Douglas-fir, various pines, and aspens.	Possible
Bald eagle	Nests and roosts in mature cottonwood forests along rivers, large streams, and lakes.	Present along Colorado River
Brewer's sparrow	Sagebrush shrublands, typically more extensive stands than in the project area..	Possible – Habitat Marginal
Midget faded rattlesnake	Cold desert dominated by sagebrush and with an abundance of rock outcrops and exposed canyon walls, typically farther west than the project area.	No suitable habitat
Great Basin spadefoot	Habitat includes pinyon-juniper woodlands and semi-desert shrublands, typically farther west than the project area.	No suitable habitat
Northern leopard frog	Wet meadows and the shallows of marshes, glacial kettles, beaver ponds, lakes, reservoirs, streams, and irrigation ditches.	No suitable habitat
Colorado River cutthroat trout	Restricted to small headwaters streams isolated from introductions or colonization by non-native trouts.	Not present
Flannelmouth sucker, bluehead sucker, and roundtail chub	Flannelmouth sucker and roundtail chub generally restricted to rivers and major tributaries. Bluehead sucker also in smaller streams. No habitat for these species within the project vicinity.	Present in Colorado River

Environmental Consequences

Proposed Action

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.

Great Basin Spadefoot (*Spea intermontana*) – This species generally inhabits seasonal pools and ponds in pinyon-juniper woodland, sagebrush, and semi-desert shrubland habitats, mostly below 6,000 feet in elevation. The project vicinity is of marginal suitability for this species, and spadefoots have not been discovered in the area. Because the project would not involve new habitat disturbance, impacts to this species would not be expected, even if it were present in area streams or ponds.

Northern Leopard Frog (*Rana pipiens*) – Unlike the spadefoot, the northern leopard frog is limited to perennial waters, including ponds and slow-flowing perennial streams or persistent portions of intermittent streams. They require streams with 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.

Midget Faded Rattlesnake (*Crotalus viridis concolor*) – The midget faded rattlesnake is a small, pale-colored subspecies of the common and widespread western rattlesnake. The midget faded rattlesnake is endemic to a small area of southwestern Wyoming, northeastern Utah, and northwestern Colorado, including western Garfield County. Suitable habitats include sandy and rocky areas in pinyon-juniper and semi-desert shrub. The relatively densely vegetated and generally north-facing aspects of the plan area are less suitable than the more barren south-facing areas north of I-70. In the unlikely event that this species were to occur in the project area, the lack of new habitat disturbance would greatly reduce the potential for adverse impacts.

Colorado River Cutthroat Trout (*Oncorhynchus clarki pleuriticus*) – Remaining populations of this subspecies of cutthroat trout occur mostly in headwater streams and lakes of the Colorado River drainage. There are no perennial streams within the vicinity of the project area, therefore the Colorado River cutthroat trout would not be affected by the Proposed Action.

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, 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). The bluehead sucker prefers areas with a rock substrate and mid to fast flowing waters. Because no perennial streams are present in the vicinity, the bluehead sucker would not be affected by the Proposed Action.

No Action Alternative

The No Action Alternative constitutes denial of the Federal APDs described in the Proposed Action and any of the associated upgrades to the pad, road and pipeline. No new surface disturbance on private or public land would occur under the No Action Alternative, thus eliminating impacts from this development to Federally listed, proposed, or candidate animal species.

Analysis on Public Land Health Standard 4 for Special Status Species

According to a recent land health assessment, habitat conditions within this area appear suitable for special status animal species known or likely to occur (BLM 2005). However, large portions of the landscape are being fragmented due to extensive natural gas development. Continued habitat fragmentation is of concern as large blocks of contiguous intact habitat are required by many species. Sustained development and the proliferation of roads, well pads, pipelines, compressor stations, tank farms and other surface facilities will continue to reduce habitat patch size and affect both habitat quality and quantity. The potential to impact some species would increase as development continues. The Proposed Action in conjunction with similar activities throughout this watershed would increase fragmentation and could increase sediment loads. Although the contribution of the Proposed Action is in itself small, it may further trend the area away from meeting Standard 4 for special status wildlife.

The No Action Alternative would not result in a failure of the area to achieve Standard 4 because the proposed developments would not occur.

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

The proposed pad is located on a sagebrush mesa (*Artemisia tridentata*) with encroaching juniper (*Juniperus osteosperma*) woodlands. Bitterbrush (*Purshia tridentata*) shrubs are found throughout the sagebrush meadow. There is a good component of native understory grasses such as bluegrass (*Poa sp.*), needle-and-thread grass (*Hesperostipa comata*), junegrass (*Koeleria macrantha*), and squirreltail (*Elymus elymoides*). West of the proposed pad is a mixed mountain shrubland community with serviceberry (*Amelanchier alnifolia*), oak brush (*Quercus gambelii*), snowberry (*Symphoricarpos rotundifolius*), and mountain mahogany (*Cercocarpus montanus*).

The access road would be constructed through a mature stand of juniper woodlands that lack understory vegetation in many sites.

Environmental Consequences

Proposed Action

Under the Proposed Action, 39.0 acres of new disturbance would occur (12.4 acres of BLM land). This disturbance would be reduced to 7.8 acres following successful interim reclamation. With implementation of standard COAs (Appendix A), desirable forbs and grasses on the unused portions of the pad, road, and pipeline 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.

No Action Alternative

No new surface disturbance on private or public land would occur under the No Action Alternative, thus eliminating impacts to vegetation.

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: decadent stands of sagebrush with poor recruitment, encroaching juniper, and widespread invasion of cheatgrass with a corresponding loss

of other functional groups such as native perennial grasses and forbs. Surface disturbance associated with the Proposed Action has the potential to encourage expansion and dominance of the site by cheatgrass and other invasive weeds. 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.

Visual Resources

Affected Environment

The Proposed Action would take place on public lands administered by the BLM and private lands along the southern lower ridges below the rim of the Roan Plateau. The Proposed Action that occurs on public lands encompasses areas classified as Visual Resource Management (VRM) Class II and IV, as identified in the 2006 Roan Plateau RMPA/EIS (BLM 2006). The objectives for VRM Classes II and IV, as defined in the BLM's Manual H-8410-1 – Visual Resource Inventory (BLM 1986), are described below.

- The objective of VRM Class II is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
- The objective of VRM Class IV is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of the viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

The NR23-2 pad and portions of the access road and pipelines would be constructed on private land, where Federal lease terms regarding visual concerns are not applicable. Visual resource values for private lands are only protected by landowner discretion.

The project area consists of finger-like ridges extending south and east from the rim of the Roan Plateau. The area is characteristic of rural agricultural land and oil and gas development closer to the I-70 corridor and, within the project vicinity, the only apparent development is the existing 2-track to the proposed NR 23-3 pad location. The Proposed Action would occur on a northeast-facing aspect of a prominent ridge below the Roan Plateau. The Roan Plateau, directly north of the project area, is the dominant topographic feature to the project area and adjacent communities along the I-70 corridor including the city of Rifle and Silt. In the vicinity of the pad, vegetation consists of sagebrush flats intermixed with scattered patches of juniper.

The proposed NR 23-3 pad would occur entirely on private land. A segment of the proposed access road (6,384 feet) and pipeline (4,901 feet) would occur on public land while the remaining segment of the pipeline (12,920 feet) and access road (4,766 feet) would occur on private lands (See Figure 4 and Table 10).

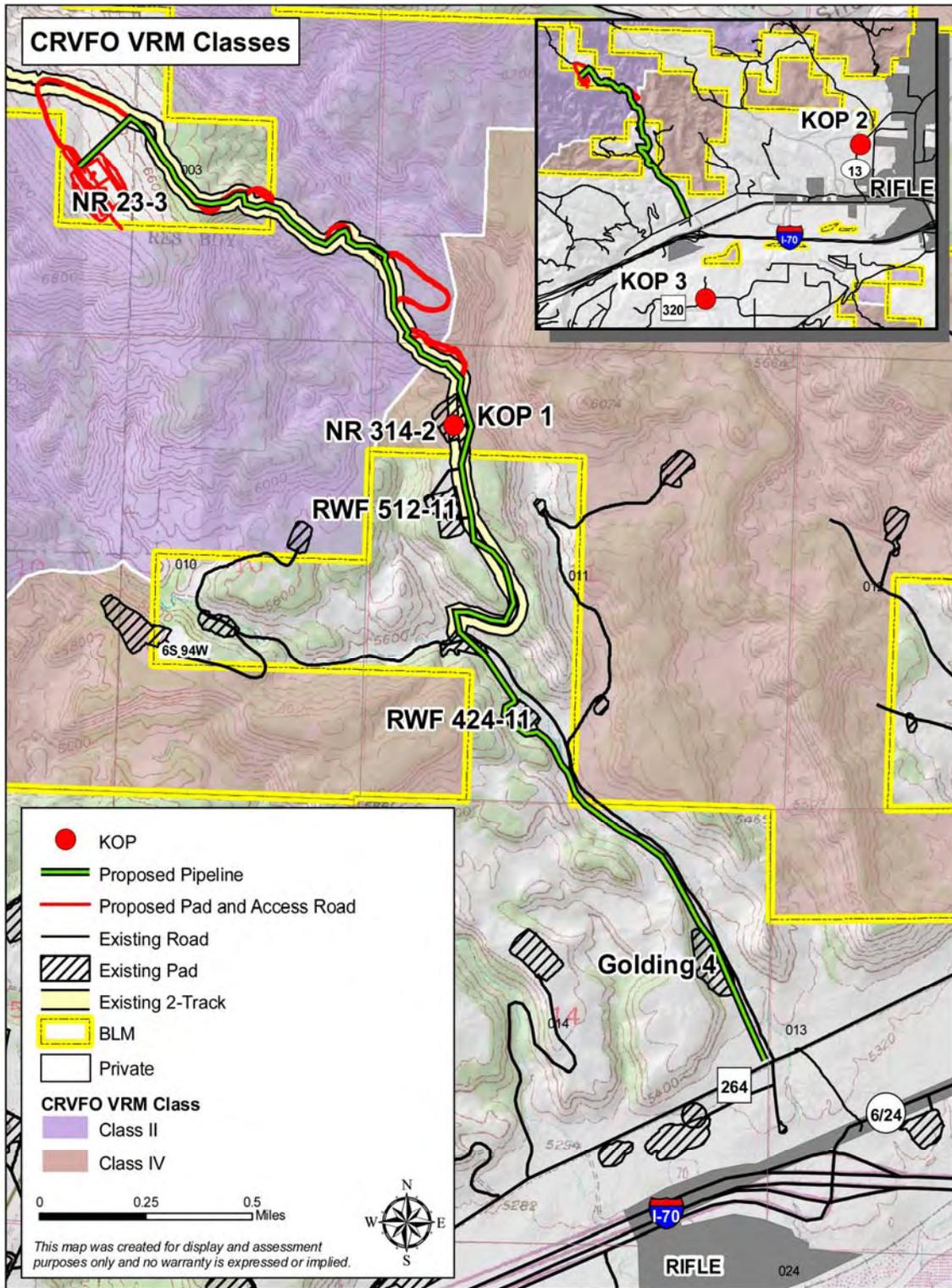


Figure 4. Proposed Action Relationship to CRVFO Visual Resource Management (VRM) Class Designations.

<i>Project Component</i>	<i>CRVFO VRM Class Designation</i>		<i>Total on BLM Land</i>
	<i>Class II</i>	<i>Class IV</i>	
Access Road	4,850 feet (0.9 mile)	1,534 feet (0.3 mile)	6,384 feet (1.2 miles)
Pipeline	3, 226 feet (0.6 mile)	1,675 feet (0.3 mile)	4,901 feet (0.9 mile)

Calculations are derived using GIS data provided by the operator. Each project component was clipped to its associated VRM Class Designation and the length in feet was calculated for each segment.

The visual resource analysis area includes the existing NR 314-2 pad located on public land administered by the BLM; Highway 13 (Rifle Bypass) along the western edge of the city of Rifle; and County road 320 on top of Taughenbaugh Mesa south of the I-70 corridor and southeast of the city of Rifle. These viewsheds are important, as they are viewed by people who live, work and recreate in the area. The Proposed Action would be located in the viewer’s foreground/middle ground, within 5 miles from Highway 13 (Rifle Bypass), County Road 320, and the existing NR 314-2 pad. BLM guidance states that lands with high visual sensitivity are those within five miles of a primary travel corridor and of moderate to very high visual exposure, where details of vegetation and landform are readily discernible and changes in visual contrast can be easily noticed by the casual observer.

The visual impact analysis for this project is based on the views from 3 Key Observation Points (KOPs) representing 2 linear viewer locations and 1 stationary viewer location representing the viewing angle and direction with the highest frequency of viewers. The existing NR 314-2 pad, Highway 13 (Rifle Bypass), and County Road 320 as described below.

KOP 1 (Figure 5) is located on the existing NR 314-2 pad, representing the viewing angle and direction with the lowest frequency of viewers. Since this location is only accessible through private land, the typical viewers would be the private landowners and oil and gas operators. The viewer would be looking directly toward the Proposed Action that crosses BLM VRM Class II. The foreground consists of bare soil with sparse vegetation, oil and gas wells, and patches of juniper draped along the ridgelines. The Roan Plateau rises in the left background. Figure 6 illustrates the landscape character of the ridge face where the access road would cross BLM land. This area has a VRM Class II designation.

KOP 2 (Figure 7) is located on Highway 13 (Rifle Bypass) located in West Rifle. This location represents a location where the Proposed Action would be most apparent to travelers and residents in West Rifle. At this location, the viewer would be looking upward toward the Proposed Action. This KOP represents a typical view a viewer would have while traveling west along I-70 from Silt to Rifle. Although the Proposed Action would be in the background from most of this I-70 stretch, it would still be noticeable. The foreground consists of rural agricultural lands, scattered rural residences, and rolling sage flats interspersed with pockets of dense juniper.

KOP 3 (Figure 8) is located along County Road 320 on top of Taughenbaugh Mesa south of the I-70 Corridor and southeast of the city of Rifle. This location represents the viewing angle and direction with the highest frequency of viewers and where the Proposed Action would be the most visible to viewers. KOP 3 represents the typical view the residents on Taughenbaugh Mesa would see when looking north and where the most impact would occur on public land. The foreground consists of finger-like mesas extending south and east from the rim of the Roan Plateau. Vegetation consists of a mixture of sage flats and blankets of junipers draping the ridgelines; the exposed ridge faces have sparser vegetation.

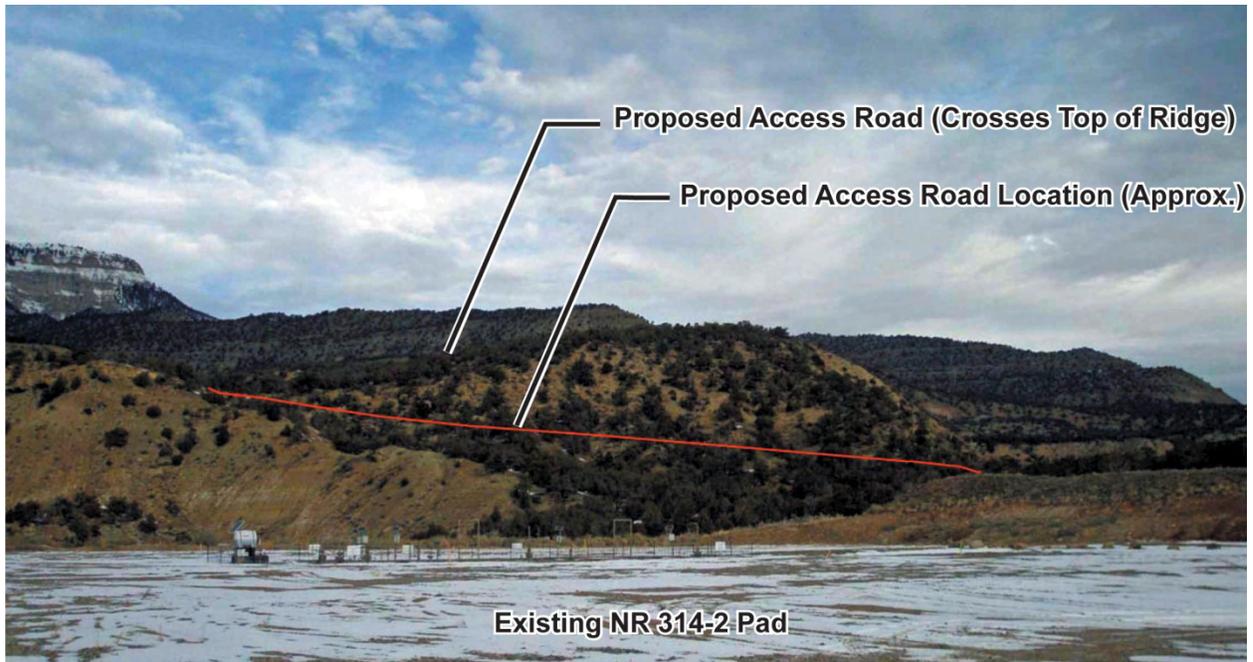


Figure 5. KOP 1



Figure 6. View looking east across the ridge face. Note: road alignment would be located below the major rock outcroppings.

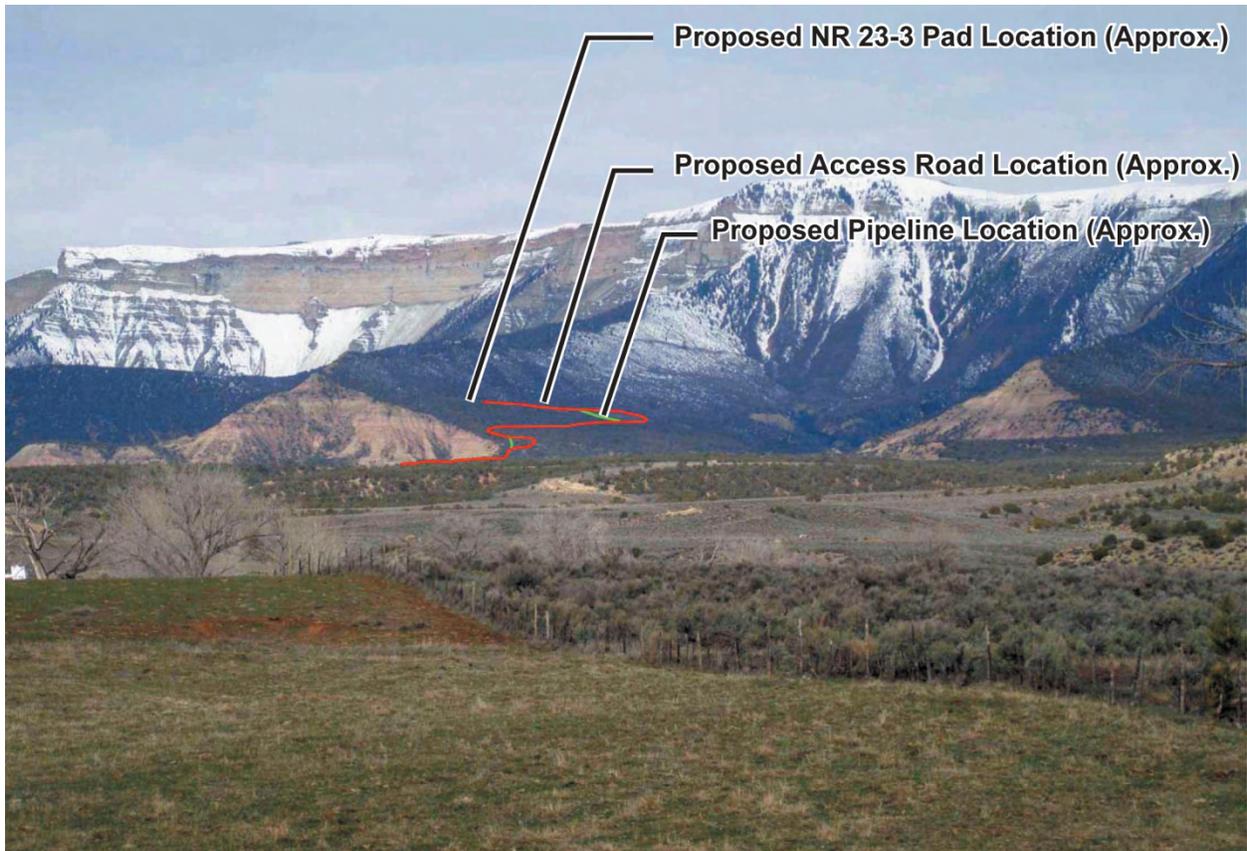


Figure 7. KOP 2

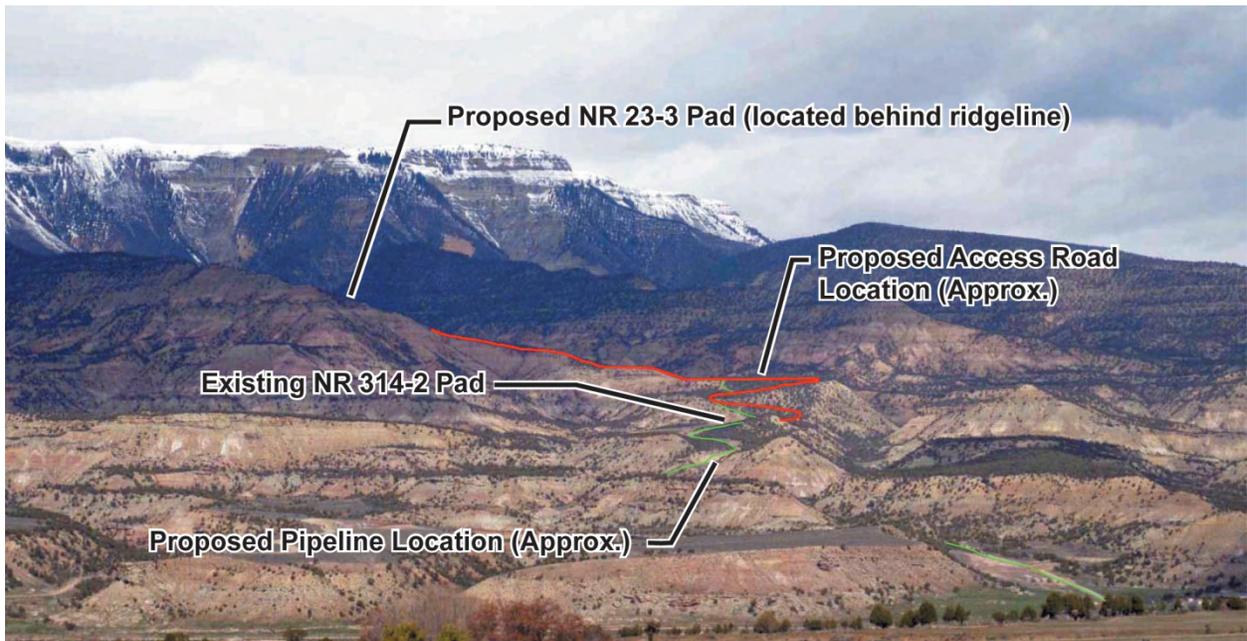


Figure 8. KOP 3. Note: As the access road ascends the long ridgeline from the last switch back toward the NR 23-3 pad location, segments of it would be hidden behind the ridgeline.

In addition to analyzing the potential impacts of the Proposed Action immediately within the project area from KOPs, viewshed analyses were conducted to determine the effects of the project from observation or visibility corridors near the project area. Using these two methods, the most dominant characteristics of the Proposed Action were identified and the results aided in defining which mitigation techniques would be the most effective.

Environmental Consequences

Proposed Action

The planning process involved several site visits to identify the best locations for access road reconstruction. The road follows the existing 2-track alignment in some locations. In the areas where the road deviates from the existing 2-track, the road was designed to utilize existing terrain so that it conforms to the landscape and reduces the amount of cut and fill required to meet grade and to eliminate distant, straight line impacts.

The pipeline follows the existing 2-track for most of the road extent, with the exception of a couple of locations where it deviates. One example occurs on private land where the pipeline leaves the existing 2-track and runs perpendicular to the existing contours to meet the pad. There is also a small segment on BLM VRM Class II land. This segment leaves the existing 2-track and travels uphill (against the existing contours) and meets up with a segment of the reconstructed access road. Outside of this deviation, the alignment of the pipeline that occurs on BLM land is consistent with the existing 2-track alignment until it reaches the NR 314-2 where it follows the eastern limit of the pad until it rejoins the 2-track alignment to the south. There is also a small segment of the pipeline that crosses BLM land to the south of the existing RWF 424-11 pad.

Short-term visual impacts due to pad and access road construction, pipeline installation, 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. The new pad, surface facilities, road improvements, and pipeline would increase the presence of drilling rigs, heavy equipment (e.g., dozers, graders, etc.), and vehicular traffic with an associated increase in dust, light pollution, and well flaring.

Proposed NR 23-3 Pad

The proposed NR 23-3 pad would occur entirely on private lands. The pad would be (600' x 330'), with a maximum cut of 34.3 feet at the southwest corner and a maximum fill of 34.5 feet at the northeast corner. The total disturbance would be 10.7 acres.

The pad would be most visible from the east as seen from KOP 2 (Figure 7). The areas with the largest amount of cut/fill occur in locations that would be the least visible from each of the KOPs because existing topography and vegetation would provide some screening. In addition, the distance, angle of view and the scale as seen by the viewer would also minimize the actual visible surface disturbance.

Since this pad occurs on private land, Federal lease terms regarding visual concerns are not applicable. Visual Resource management objectives do not apply to non-BLM lands; visual values for those lands are only protected by landowner discretion. Given the relative remoteness of the site, the standard Best Management Practices (BMPs) related to reclamation, facility paint colors, and screening the road and pipeline alignments from view would mitigate the visual impacts of the project.

After drilling and well completion work, the pad would be reshaped and seeded reducing the pad size to approximately 1.8 acres.

Proposed Access Road

The proposed access road reconstruction would cross land administered by the BLM and private land. During road pioneering, topsoil would be stripped and windrowed along the upper and lower sides of the road disturbance corridor to provide enhanced reclamation opportunities. The trees to be cleared for the road and pipeline work would be hydro axed to reduce fuel loadings and visual impacts. By hydroaxing the root structure would be preserved which would facilitate vegetative growth and reduce erosion. The reconstructed access road would be built with a 24-foot running surface. The road grade would average 10% with a couple of pitches approaching 15% because of topographical inability to feasibly reduce the grades. The short-term surface disturbance related to the road construction work (which would include the burial of the 12-inch gas line and the 6-inch water line) would amount to 18.7 acres based on an average disturbance corridor width of 75 feet.

The segment of the road that crosses BLM land passes through 2 VRM Class designations: 4,850 feet occurs in VRM Class II and 1,534 feet occurs in VRM Class IV (Table 10). The segment that passes through VRM Class II would be the most visible from KOPs 1, 2, and 3 (Figures 5, 7, and 8) and would require the most mitigation.

- The areas where bedrock or rock outcroppings must be removed, the final cut edge should emulate the natural fracture lines of the rock as seen in the undisturbed landscape. Rock forms should be irregular in shape.
- The cut-and-fill slopes should meet the existing grades at natural angles to create a more natural appearance.
- Woody vegetation in and below fill slopes should be preserved during construction to provide visual screening. Care should be taken to preserve the integrity of the stands during interim reclamation.
- During interim reclamation, the disturbed and constructed slopes should have a roughened and undulating finish to encourage vegetation growth and reflect light in an irregular pattern to break up the texture and color of the exposed slopes.
- Rocks and woody debris should be saved during the construction process and be replaced onto the cut/fill slopes to emulate the color and texture closer to that of the native landscape and to encourage vegetation growth. Care should be taken to preserve the canopy of the woody debris while storing and transporting.
- Spoils from the road should not be side cast and should be used in areas requiring more fill material.
- Road surfacing should be similar color to adjacent dominant soil colors. Dust abatement measures would also darken the appearance and prevent the visual impacts from vehicular traffic.

The segment of the road that passes through VRM Class IV would be the least visible of the entire segment of the reconstructed road as seen from KOP 1, KOP 2, and KOP 3 (Figures 5, 7, and 8).

- Rocks and woody debris should be saved during the construction process and be re-placed onto the cut/fill slopes to emulate the color and texture closer to that of the native landscape and to encourage vegetation growth. Placement of rocks and woody debris on the cut/fill slopes would also deter off-road travel, which would prevent additional surface disturbance, expansion of the road corridor and visual impacts. Care should be taken to preserve the woody debris canopy while storing and transporting.

Short-term disturbance would be 10.2 acres. After the road and pipeline area are completed and reclaimed, the long-term disturbance (based on a road running width of 24 feet) would total 6.0 acres with 3.3 acres occurring on BLM.

Proposed Pipeline

North of the NR 314-2 pad 3,340 feet of pipeline would be installed within the old 2-track alignment (Figure 4). The pipeline follows the existing 2-track for most of the road extent, with the exception of a couple of locations where it deviates. One example occurs on private land where the pipeline leaves the existing 2-track and runs perpendicular to the existing contours to meet the pad. This segment would contrast with the existing landform creating straight line visual impacts. Since this segment occurs on private land Federal lease terms regarding visual concerns are not applicable. Visual Resource management objectives do not apply to non-BLM lands; visual values for those lands are only protected by landowner discretion. This analysis provides recommendations only to reduce visual impacts.

There is also a small segment on BLM VRM Class II land. This segment leaves the existing 2-track and travels uphill (against the existing contours) and meets up with a segment of the reconstructed access road. Outside of this deviation, the alignment of the pipeline that occurs on BLM land is consistent with the existing 2-track alignment until it reaches the NR 314-2 where it follows the eastern limit of the pad until it rejoins the 2-track alignment to the south. There is also a small segment of the pipeline that crosses BLM land to the south of the existing RWF 424-11 pad.

- In locations where the pipeline deviates from the existing 2-track the pipeline corridor should follow the natural contours so that they conform to the landscape and reduce the amount of cut and fill required to meet grade and to eliminate distant, straight line impacts.
- In the area where the pipeline crosses VRM Class II, across the face of the ridge and perpendicular to the natural contours and deviates from the existing 2-track, the pipeline should follow the edge of the denser juniper stands so that the corridor does not split the form of the more open section of the ridge face with sparser vegetation. The pipeline should hug the vegetation line. This should reduce the strong linear form created by the pipeline corridor.
- Rocks and woody debris should be saved during the construction process and be re-placed onto the cut/fill slopes to emulate the color and texture closer to that of the native landscape and to encourage vegetation growth. Placement of rocks and woody debris on the cut/fill slopes would also deter off-road travel, which would prevent additional surface disturbance, expansion of the road corridor and visual impacts. Care should be taken to preserve the canopy while storing and transporting.
- The segments of the existing 2-track that would not be part of the reconstructed road should be recontoured and revegetated once the pipeline is in place.

The short-term disturbance (using a 50-foot wide corridor) would amount to 3.9 acres with 2.2 acres on BLM. Additionally, the new gas and water pipeline would be installed along the existing road between the NR 314-2 pad and the mainline connection point south of the Golding 4 pad.

No Action Alternative

Under the No Action Alternative, none of the components of the Proposed Action would be approved and there would be no new surface disturbance. This would eliminate new impacts to the visual environment and impacts to VRM Class II and Class IV lands.

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 National Environmental Policy Act 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 Glenwood Springs Resource Area, Oil & Gas Leasing & Development, Draft Supplemental Environmental Impact Statement (June 1998), Appendix L, Hazardous Substance Management Plan, contains a comprehensive list of materials that are commonly used for oil and gas projects. It also includes a description of the common industry practices for use of these materials and disposal of the 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 of the 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 (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 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.

Emergency response to hazardous materials or petroleum products on BLM lands are handled through the BLM Grand Junction Field Office contingency plan. 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 the construction phase of this project would include diesel fuel, hydraulic fluid, and lubricants. These materials would be used during construction of the pads, roads, and pipelines, and for refueling and maintaining equipment and vehicles. Potentially harmful substances used in the 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, to a limited extent, during 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, no new Federal wells would be drilled, the pad would not be constructed and no new surface disturbance would occur.

Water Quality, Surface and Ground (includes an analysis on Public Land Health Standard 5)

Surface Water

Affected Environment

The project area is within the Colorado River below Cache Creek 6th-code watershed unit. The ephemeral streams in the vicinity of the project flow southerly and drain directly into the Colorado River, approximately 3 miles south of the NR23-3 pad.

At this time, there are no water quality data for the ephemeral drainages near the NR-23-3 pad site. According to the *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 4a, which includes tributaries to the Colorado River from its confluence with the Roaring Fork River to a point immediately below its confluence with Parachute Creek. Following is a brief description of segment 4a.

Segment 4a – This segment has been classified aquatic life cold 2, recreation N, water supply, and agriculture. Aquatic life cold 2 indicates that this water course is not capable of sustaining a wide variety of cold or warm water biota due to habitat, flows, or uncorrectable water quality conditions. Recreation class N refers to waters that are not suitable or intended to become suitable for primary contact recreation. This segment is, however, suitable or intended to become suitable for potable water supplies and agricultural purposes that include irrigation and livestock

These drainages are not currently on the State of Colorado’s *303(d) List of Impaired Waters and Monitoring and Evaluation List* (CDPHE, WQCC Regulation No. 93) (CDPHE 2010). At this time, no water quality data are available for these drainages. The USGS has not collected any surface water flow and quality data at sites near the project area (USGS 2007). Data were collected from the Colorado River below the project area near Rulison in 1977 and 1978 (Table 11).

Table 11. Selected Water Quality Data for Two Sampling Locations near the project area		
Parameter	Colorado River below Rulison CO, USGS Site #09092570 01/18/1978	Colorado River below Rulison CO, USGS Site #09092570 4/8/1977
Instantaneous discharge (cfs)	1,500	1,560
Temperature, water (°C)	2.5	11
Field pH (standard units)	7.9	8.1
Specific conductance (µS/cm/cm at 25°C)	1,320	1,200
Total Dissolved Solids (mg/L)	756	733
Hardness as CaCO3 (mg/L)	280	250
Chloride (mg/L)	230	230
Selenium (µg/L)	2	1
Dissolved oxygen (mg/L)	11.2	10
NA = data not available. Source: USGS 2007		

No sediment measuring stations are present on the Colorado River or its tributaries near the pad location. The closest downstream station on the Colorado River is near DeBeque, Colorado. A summary of USGS data collected at this station indicates that the mean sediment load was 1,817 tons per day during the period of 1974 to 1976. The maximum and minimum for this location during the same period was 41,300 and 8 tons/day respectively (USGS 2007).

Environmental Consequences

Proposed Action

Potential impacts to surface water associated with the Proposed Action include increased erosion and sedimentation of streams due to changes in channel morphology due to road and pipeline crossings, and contamination by drilling fluids, produced water, or condensate. Surface waters would be most susceptible to sedimentation during construction, drilling, and completion activities, which would collectively last approximately 120 days. After this period, reclamation activities would substantially reduce surface exposure, decreasing the risk to surface waters over the long term.

Although surface waters would be most susceptible to sedimentation over the short-term, access roads would remain in place over the life of the well (i.e., 20 to 30 years) and would channel runoff during periods of precipitation. Sedimentation and stream channel impacts associated with roads would be reduced through the implementation of Best Management Practices (BMPs) and other preventative measures. As proposed, these measures would include limiting cut slope steepness, step-cutting, limiting road grade to 10%, crowning road surfaces, installing culverts and drainage systems, and applying gravel to all new or upgraded BLM roads in the project area to a compacted thickness of 6 inches (Appendix A).

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 which recycles drilling fluids; cuttings would be dried through the use of a shaker system and be stacked against the cutslope on the pad. A traditional reserve pit would not be constructed.

Tanks used to store produced water and condensate would be placed in secondary containment to prevent offsite release. In the event of an accidental release, produced water and condensate would be confined for cleanup in a containment area and would not migrate to surrounding soils or surface waters. Pipelines associated with the transport of these liquids would be pressure tested to detect leakage prior to use. Cuttings must be decontaminated to COGCC standards prior to pit closure; the table of applicable standards can be found at http://cogcc.state.co.us/RR_docs_new/rules/900Series.pdf

Refer to Appendix A for standard Conditions of Approval that would mitigate impacts to surface water. Through the use of COAs and BMPs associated with construction activities, prompt interim reclamation, and the implementation of the preventative measures associated with the treatment of fluids, impacts to surface waters would be minimized and should be minor.

No Action Alternative

Under the No Action Alternative, the project components included in the Proposed Action would not be approved and constructed. Therefore, no impacts to surface water would accompany the Proposed Action.

Waters of the U.S.

Affected Environment

Section 404 of the Clean Water Act requires a Department of the Army permit from the U.S. Army Corps of Engineers prior to discharging dredged or fill material into waters of the United States as defined by 33 CFR Part 328. A Department of the Army permit is required for both permanent and temporary discharges into waters of the United States.

Environmental Consequences

Proposed Action

No new crossings of waters of the U.S. or streams that are potentially waters of the U.S. are included in the Proposed Action, nor is there any pad construction that could discharge fill into waters of the U.S.

Improperly designed crossings of small ephemeral drainages, in particular undersized or poorly aligned culverts, could result in soil degradation that could include excessive erosion at culvert outlets, potentially supplying sediment to the Colorado River approximately 3 miles to the south. However, standard and site-specific surface-use COAs listed in Appendix A would be implemented to protect the Colorado River and any other waters of the U.S. that could be impacted by such long-distance stormflow transport.

No Action Alternative

Under the No Action Alternative, the project components included in the Proposed Action would not be approved and constructed. Therefore, no impacts to waters of the U.S. would result.

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, 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 upper most 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 the 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 milligrams per liter in many of the basin-margin areas to more than 10,000 milligrams per liter 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 found 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).

No permitted domestic water wells are located within the proposed disturbance for the pad or the proposed access road segment. Two documented fresh-water well locations are found within a 2-mile radius of the proposed well pad. A monitoring well is located approximately 1.7 miles northeast in Section 32, T5S, R93W. No well parameters are available for this well. The second well is identified as a domestic well, and is found approximately 1.9 miles east in Section 1, T6S, R93W. Well parameters are also undefined for this well. Numerous water wells are found downgradient of the well pad, closer to discharge points found along the Colorado River. Well parameters were analyzed for a cross section of these wells and results indicate shallow well depths of 100 feet or less, and static water levels of 60 feet or less, indicative of wells completed in alluvial deposits.

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 (fracing) 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 below ground surface (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 B).

No Action Alternative

Under the No Action Alternative, the proposed development project would not be approved and constructed. As a result, no impacts to groundwater resources within the project boundary would occur.

Analysis on the Public Land Health Standard for Water Quality

The Proposed Action and the No Action Alternative would be unlikely to prevent Standard 5 from being achieved. This is due to the lack of water bodies and riparian areas that would be affected by the project and by the lease stipulations, COAs, and requirements set for permitting by the COGCC and USACE.

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

Affected Environment

Aquatic habitat is severely limited in the project area given the intermittent nature of area streams. No fish occur in the unnamed ephemeral drainages given their small size and limited water flow.

Environmental Consequences

Proposed Action

As aquatic habitats does not occur within the project area, the Proposed Action would not have any direct impact on aquatic wildlife. Potential indirect effects to threatened and endangered fish in the Colorado River are discussed in the section on Special Status Species.

No Action Alternative

The No Action Alternative constitutes denial of the Federal APDs described in the Proposed Action and any of the associated upgrades to the pad, road and pipeline. No new surface disturbance on private or public land would occur under the No Action Alternative, avoiding impacts to aquatic wildlife.

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

The No Action Alternative would have no bearing on the ability of the area to meet Standard 3, because no new developments would occur.

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

Affected Environment

Mammals

The site is located within winter range and severe winter range for mule deer (*Odocoileus hemionus*) as mapped by CDOW (2008). 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) (CDOW

2008). 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 (CDOW 2006). Field surveys indicate that the project area is occupied winter range for elk and that mule deer occupy on a year-round basis.

Large carnivores present in the project vicinity include the mountain lion (*Puma concolor*) and black bear (*Ursus americanus*). CDOW (2008) has mapped the northern portion of the project area as black bear (*Ursus americanus*) overall range. 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

Raptors potentially nesting in the large Junipers throughout the project vicinity include two small resident hawks (Cooper's hawk, sharp-shinned hawk) and, where taller conifers are present for nesting or perching, two larger resident raptors (red-tailed hawk and great horned owl). Other birds of prey potentially present include three small owls: the migratory flammulated owl and the resident northern pygmy owl and northern saw-whet owl, the latter two primarily where tall conifers or tall deciduous trees are present among the shrubs.

Other residents or short-distance migrants species in the project vicinity include the northern flicker (*Colaptes auratus*), common raven (*Corvus corax*), black-billed magpie (*Pica hudsonia*), western scrub-jay (*Aphelocoma californica*), mountain and black-capped chickadees (*Poecile gambeli*, *P. atricapillus*), American robin (*Turdus migratorius*), Townsend's solitaire (*Myadestes townsendi*), blue-gray gnatcatcher (*Poliophtila caerulea*), and house finch (*Carpodacus mexicanus*). 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*).

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, the spadefoot toad and Woodhouse's toad occur primarily along ephemeral washes that do not support fish and contain pools of water for a period of at least a few weeks every spring. The chorus frog occurs primarily in cattail and bulrush wetlands and along the vegetated margins of seasonal or perennial ponds and slow-flowing

streams. Some existing stock ponds and slow-flowing portions of the drainages are potentially suitable for the northern leopard frog, though none have been documented.

Environmental Consequences

Proposed Action

The Proposed Action would result in the initial loss and fragmentation of 39.0 acres of wildlife habitat. Following partial reclamation of new well pads and roads, long-term forage disturbance would be reduced to approximately 7.8 acres for the Proposed Action. 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+ years following reclamation that it would take for these woody species to re-establish. Surface disturbing activities within these habitats during the winter and during migratory seasons have the potential to displace mule deer and elk from these important habitats.

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).

The southern portion of the proposed road reconstruction work falls under Federal lease COC27869, which carries a big game winter timing limitation from January 1 through May 31 while the northern portion crossing Federal lease COC62160 has a winter timing limitation from December 1 through April 30. For the purposes of this project, the standard 5-month winter timing limitation identified in the existing land use plan (December 1 – April 30) shall be enforced with the issuance of the APDs and BLM Rights-of-way.

No Action Alternative

The No Action Alternative constitutes denial of the Federal APDs described in the Proposed Action and any of the associated upgrades to the pad, road and pipeline. No new surface disturbance on private land would occur under the No Action Alternative, thus eliminating impacts from this development to terrestrial wildlife species.

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: (1) direct habitat losses; (2) habitat fragmentation and losses in habitat effectiveness; (3) elevated potential for runoff, erosion, and sedimentation; (4) expansion of noxious weeds and other invasive species; and (5) increased noise and traffic and reductions in the scenic quality of the area (BLM 1999a: 4-1 to 4-68).

Although 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 nonetheless clear that past, present, and reasonably foreseeable future actions has had and would continue to have adverse affects on various elements of the human environment. The anticipated impact levels for existing and future actions range from negligible to locally major, and primarily negative, for specific resources. The primary reasons for this assessment are twofold: (1) the rate of development, particularly oil and gas development, has until recently been increasing in the area, resulting in an accelerated accumulation of individually nominal effects; and (2) residential and commercial expansion, as well as most of the oil and gas development, has occurred private holdings lands where mitigation measures designed to protect and conserve resources are not in effect.

It is clear that the Proposed Action would contribute to the collective adverse impact for some resources. Although the contribution would be very minor, the Proposed Action would contribute incrementally to the collective impact to air quality, vegetation, migratory birds, terrestrial wildlife, and other resources.

PERSONS AND AGENCIES CONSULTED

Williams Production RMT Company: April Mestas, Dan Collette, Kris Meil
 MB Construction: Bernard Herwell, Jean Thurston
 Garfield County Oil and Gas Liaison: Nikki Reckles

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 12.

Table 12. 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
Jim Byers	Natural Resource Specialist	EA Project Lead, Access & Transportation, Range Management, Socio-Economics
Allen Crockett, Ph.D.	Supervisory Natural Resource Specialist	NEPA Review
William Howell	Petroleum Engineer	Downhole COAs
Shauna Kocman, Ph.D.	Hydrologist	Air Quality, Noise, Soils, Surface Water, Waters of the U.S.

Table 12. BLM Interdisciplinary Team Authors and Reviewers		
<i>Name</i>	<i>Title</i>	<i>Areas of Participation</i>
Julie McGrew	Natural Resource Specialist	Visual Resources
Sylvia Ringer	Wildlife Biologist	Migratory Birds, Special-status Species (Animals), Wildlife, Aquatic and Terrestrial
Todd Sieber	Geologist	Geology and Minerals, Groundwater, Paleontology

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BUREAU OF LAND MANAGEMENT

FONSI
DOI-BLM-CO-040-2011-0073 EA

The environmental assessment analyzing the environmental effects of the Proposed Action has been reviewed. The approved mitigation measures result in a Finding of No Significant Impact on the human environment. Therefore, an environmental impact statement is not necessary to further analyze the environmental effects of the Proposed Action.

DECISION RECORD

DECISION: It is my decision to approve the construction and associated maintenance of the NR23-3 well pad, access road, natural gas and water pipelines, and the temporary surface frac lines as shown on the plats in the Applications for Permit to Drill (APDs) and approve the drilling, completion, and production operations for the Federal well (NR514-3) as described in the APD package. Furthermore, it is my decision to proceed with the processing of the linear rights-of-way for the segments of reconstructed road and gas/water pipelines that cross public land to serve the ten Fee wells to be drilled and produced from the NR23-3 pad. This decision will provide for the orderly, economical, and environmentally sound exploration and development of oil and gas resources on valid oil and gas leases.

Initiation of the any surface disturbing activities related to road reconstruction or pipeline installations on public land or drilling and completion activities on the NR23-3 pad associated with Federal oil and gas well shall not commence until approval by the BLM of an APD and the granting by the BLM of any rights-of-way issued in connection with the project.

This decision will provide for the orderly, economical, and environmentally sound exploration and development of oil and gas resources on valid oil and gas leases.

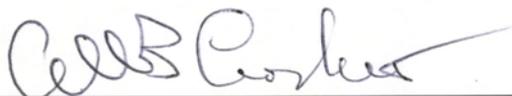
RATIONALE: The bases for this decision are as follows:

1. Approval of the Proposed Action is validating the rights granted with the Federal oil and gas leases to develop the leasehold to provide commercial commodities of oil and gas.
2. The environmental impacts have been mitigated with measures incorporated into the Proposed Action or as specified in the Conditions of Approval (COAs) appended to the EA.

MITIGATION MEASURES: Mitigation measures presented in Appendix A will be applied as COAs for both surface and drilling operations.

NAME OF PREPARER: Jim Byers, Natural Resource Specialist

SIGNATURE OF AUTHORIZED OFFICIAL:



Allen B. Crockett, Ph.D., J.D.
Supervisory Natural Resource Specialist

5/9/11

Date

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APPENDIX A

Surface Use and Downhole Conditions of Approval

NR23-3 pad

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SURFACE USE CONDITIONS OF APPROVAL

DOI-BLM-CO-N040-2011-0073 EA

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. Brush Clearing for Pad, Pipeline and Road Work. The road, pad and pipeline brush/tree clearing work shall be accomplished with the use of a brush cutter machine (hydro-axe). Such clearing work shall be completed prior to start of any earthwork unless otherwise authorized by the BLM.
3. 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. (*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.*)
 - a. Road Construction Staking. The road centerline would be flagged and staked prior to the start of tree/brush clearing and/or earthwork within the planned disturbance corridor. The edges of disturbance for the road and pipeline would be established with flagging before the tree clearing work is completed. Consideration shall be given to the extra pipeline construction space needed during the road corridor staking.
 - b. Construction Best Management Practices. The following BMPs proposed by the operator would be incorporated into the construction techniques to address any saturated or fragile soil conditions, seeps, springs or slumps encountered during the actual road pioneering:
 - During the initial road pioneering, a surface disturbance corridor shall be established with sufficient area to allow trenching, spoil storage and pipeline burial within the roadway disturbance corridor.
 - Road structures and cut/fill instability issues, if present, shall be mitigated with soil and slope reinforcement including, but not limited to; soil importation, mechanical compaction, design and installation of synthetic geogrids, aggregated subgrade and road base, mechanically stabilized earth walls, and gabion buttress walls and mattresses.
 - Surface runoff shall be mitigated with, but not limited to, the installation of CMP culverts, borrow ditches, diversion berms, riprap and other diversionary structures as required by site conditions.
 - Subsurface ground water shall be mitigated with the installation of several alternatives including, but not limited to; gravel pack drains, French drains, and collection sumps as required by site conditions.

- All road construction activities shall be supported with a fully implemented stormwater management plan, best management practices and a reclamation/vegetation plan.
- c. Earthwork Sidecasting Restriction. On the NR23-2 Access Road, where sideslopes exceed 50% and between S, no sidecasting from road construction shall be allowed; excavated material shall be end-hauled or machine-drifted to a location with gentler slopes – preferably where additional fill material will be needed. Where feasible in areas with sideslopes less than 50%, cuts shall be laid back to 2:1 slope in order to break up the visual scar and facilitate reclamation.
- d. Construction Techniques along Sandstone Ledge. A track-mounted hammer-hoe shall be used to break down large boulders along 700 feet of new road construction (STA 4+00 to STA11+00 on Bookcliff's Plan and Profile dated 11/29/10). All efforts shall be made to avoid sidecasting the rock or losing rolling material off the downhill side of the road so nearby vegetation remains undamaged. The machine-worked rock shall be integrated into the constructed road to serve as a catch berm for the toe of the fill, used as fill stabilizer, or could be tightly stacked to increase the slope of the fill and blend the appearance of the new road with the existing sandstone ledge.
- e. Traffic Control Gate Installation. The existing steel frame gate located below STA11+00 shall be removed and established at a new location to be determined jointly by BLM, Williams and Clough family representative.
- f. Old 2-Track Reclamation. Any old 2-track road segments not used for the access road reconstruction or as a pipeline corridor shall be physically closed with rocks and tree slash to deter vehicle use, ripped to a minimum depth of 12 inches, seeded and reclaimed per BLM Reclamation COAs. After pipelines are buried in the targeted 2-track road segments, the disturbance corridor shall be physically closed with tree and rock barriers to deter vehicle use on these reclaimed pipeline segments.

Additional road construction COAs are listed under Item #19. Visual Resources.

4. Drill Cuttings Management. The drill cuttings shall be placed in an excavated trench on the pad or stacked against the cutslope on the pad surface. The cuttings shall be remediated per COGCC regulations (Table 910-1 standards) prior to trench closure and/or earthwork reshaping related to well pad interim reclamation.
5. 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.
6. 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 Western Colorado Regulatory Branch at 970-243-1199.

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.

7. 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 Western Colorado Regulatory Branch at 970-243-1199. Copies of any printed or emailed approved USACE permits or verification letters shall be forwarded to the BLM.
8. 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.
9. 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 for the pad. Reclamation, including seeding, of temporarily disturbed areas along roads, pipelines, and topsoil piles and berms, shall be completed within 30 days following completion of construction.

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 #18) 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.
10. 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**.
11. Big Game Winter Range Timing Limitation. To protect big game winter habitat use, the timing limitation related to Federal lease COC62160 shall be applied: During the **December 1 to April 30** period, construction, drilling, and completion activities are prohibited. Operation and maintenance activities are permissible.

12. 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 in the BLM Field Office (970-876-9051).
13. Raptor Nesting. Raptor nest surveys for NR23-3 project conducted in 2010 and spring 2011 did not result in location of raptor nest structures within 0.25 mile of a well pad or 0.125 mile of an access road, pipeline, or other surface facility associated with this project. Therefore, a Raptor Nesting Timing Limitation COA is not attached to this EA. Although BLM considers surveys conducted for a NEPA Environmental Assessment to be valid for 2 years, new nests may be built and occupied between the initial surveys and project implementation. To ensure compliance with the Migratory Bird Treaty Act, the operator should schedule construction or drilling activities to begin outside the raptor nesting season (February 1 to August 15) if practicable. If initiation of construction, drilling, or completion activities during these dates cannot be avoided, the operator is responsible for complying with the Migratory Bird Treaty Act, which prohibits the “take” of birds or active nests (those containing eggs or young), including nest failure caused by noise and human activity.
14. 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, frac-water pits, cuttings trenches (if covered by water/fluid), and evaporation pits. Fluids 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 in the BLM Field Office at 970-876-9051 and visit <http://www.fws.gov/mountain-prairie/contaminants/oilpits.htm>.
15. 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 COA will be granted if nesting surveys conducted no more than one week prior to surface-disturbing activities indicate that no BCC species are nesting or otherwise present within 10 meters of the area to be disturbed. 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 15 and continue into the 60-day period at the same location.

16. 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.
17. 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.
18. 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).

19. Visual Resources. 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.

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.

Above-ground facilities shall be painted **Shadow Gray** to minimize contrast with adjacent vegetation or rock outcrops. The color shall be specified by the BLM and attached as a COA to individual APDs.

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

During the access road reconstruction, those areas where bedrock or rock outcroppings must be removed, the final cut edge shall emulate the natural fracture lines of the rock as seen in the undisturbed landscape. Rock forms shall be irregular in shape.

After construction, the road alignment shall be reviewed to determine if the road surface color detracts from 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.

20. 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. Specifically for roads, topsoil windrows shall be created above the top of the planned cutslope and below the toe of the planned fillslope, where feasible based on topography. Topsoil berms shall be promptly seeded to maintain soil microbial activity, reduce erosion, and minimize weed establishment.
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. Interim Reclamation Related to Drilling Phases. Within 1 year of completion of all exploratory wells proposed on a pad or within one year of completion of all development wells on a pad (whichever the situation may be), the operator would stabilize the disturbed area by recontouring, mulching, providing run-off and erosion control, replacing topsoil as directed, and seeding with BLM-prescribed native seed mixes (or landowner requested seed mix on Fee surface), and conducting weed control, as necessary. In cases where the exploratory drilling and development drilling on a single pad occur more than 1 year apart, slopes shall be recontoured to the extent necessary to accommodate seeding, and seed mixes required by BLM or requested by the private landowner shall be applied to stabilize the soil between visits per direction of the BLM.

SITE-SPECIFIC COAS APPLICABLE TO GAS AND WATER PIPELINES

These COAs shall be attached to the Pipeline Right-of-Way Grants issued for this project.

1. Brush Clearing for Pipeline Work. The pipeline brush/tree clearing work shall be accomplished with the use of a brush cutter machine (hydro-axe) across the entire planned disturbance corridor for the pipeline unless otherwise authorized by the BLM. Such clearing work shall be completed prior to start of any earthwork.
2. Pipeline Excavation Restrictions. Excavation work disturbing the topsoil and underlying root mass shall occur only above the planned pipeline trench area. Areas within the disturbance corridor that will serve as topsoil or trench spoil areas shall have topsoil and root mass remain in place with the excess materials windrowed on top of the mowed vegetation.

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.

3. Pipeline Installations. The steel gas pipeline (maximum twelve-inch diameter) and the steel or poly water pipeline (Maximum 6-inch diameter) serving the NR23-2 pad shall be buried concurrently alongside the NR23-3 access road except where an unused 2-track road segment is encountered (as shown on the Insert Map in NR23-2 Pan of Development dated 1/20/10). The pipeline shall be installed within the planned road disturbance corridor. For the segments of pipeline installed along the unused 2-Track segments, the maximum disturbance width would be 50 feet. For the segments of pipelines to be installed along the main access road south of the NR314-2 road, the new disturbance related to the pipeline burial shall be limited to 15 feet.

Should a temporary water line serve the water delivery needs for the NR23-2 pad, that line shall be laid within the existing road-pipeline disturbance area and shall be decommissioned and removed prior to winter weather conditions (December 1) unless otherwise approved by the Authorized Officer.

4. Hydrostatic Pipeline Testing. After testing of newly installed pipelines including surface water delivery lines, water used in pressure testing of the lines shall be disposed at a State-approved facility or reused for drilling and/or completion operations.
5. 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. (49 CFR 192.225 Welding procedures) All welders shall be appropriately certified. (49 CFR 192.227 Qualification of welders). (NOTE: 49 CFR Subpart F – Joining of Materials Other than by Welding (192.281 includes plastic pipe).)
6. Pipeline 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(a) Buried Pipelines).
7. Surface Pipelines: All surface pipelines shall be marked with surface signs denoting the type of pipeline, WARNING notations, CONTACT information.
8. Pipeline Testing and Notifications. The entire pipeline shall be tested in compliance with DOT regulations (49 CFR Part 192). Incremental segments of the pipeline shall be tested to the desired maximum pressure and held for the duration of the test (8 hours minimum). (49 CFR 192.503.c).

Notification to all nearby residents as well as the Garfield 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.

9. 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).
10. Visual Resources _Rocks saved during construction should be replaced “white side down” on the pipeline corridor during interim reclamation to reduce the amount of color contrast with the surrounding landscape and to deter off-road travel.

DOWNHOLE CONDITIONS OF APPROVAL
Applications for Permit to Drill

Company/Operator: Williams Production RMT Company

Surface Location: NESW, Section 3, Township 6 South, Range 94 West, 6th P.M.

<u>Field</u>	<u>Well No./Pad</u>	<u>Bottomhole Location</u>	<u>Lease/Unit</u>
Rulison	Clough NR 514-3/NR 23-3	SWSW, Sec 3, T6S, R94W	COC62160

15. 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.
16. 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 COAs, and conducting other operations not specified within the APD. Contact, Will Howell at 970-876-9049 (office) or 970-319-5837 (cell) for verbal approvals.
17. If a well control issue (e.g. kick, blowout, water flow, casing failure, or a bradenhead pressure increase) arises during drilling or completions operations, Will Howell 970-876-9049 (office), 970-319-5837 (cell) shall be notified within 24 hours from the time of the event. IADC/Driller's Logs and Pason Logs (mud logs) will be forwarded to CRVFO, Will Howell, 2300 River Frontage Road, Silt, CO 81652 within 24 hours of a well control event.
18. The BOPE shall be tested and conform to Onshore Order No. 2 for a **3M** system and recorded in the IADC/Driller's log. A casing head rated to 3,000 psi or greater shall be utilized.
19. An electrical/mechanical mud monitoring equipment shall be function tested prior to drilling out the surface casing shoe. As a minimum, this equipment shall include a trip tank, pit volume totalizer, stroke counter, and flow sensor.
20. 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 loss.
21. A gas buster shall be functional and all flare lines effectively anchored in place, prior to drilling out the surface casing shoe. The discharge of the flare lines shall be a minimum of 100 feet from the wellhead and targeted at bends. 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. Where noncombustible gas is likely or expected to be vented, the system shall be provided supplemental fuel for ignition and maintain a continuous flare.
22. After the surface casing is cemented, in order to make sure the surface casing is set in a competent formation, a Pressure Integrity Test/Mud Equivalency Test/FIT will be performed on the first well drilled

in accordance with OOGO No. 2, Sec. III, B.1.i. This is not a Leak-off Test, but a formation competency test, ensuring that 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 (whowell@blm.gov) on the first well drilled on the pad and record results in the IADC log.

23. 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 will be submitted to CRVFO, Will Howell; 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 for remedial operations.

A greater volume of cement may be required to meet the 200-foot cement coverage requirement for the Williams Fork Formation/Mesaverde Group. Evaluate the top of cement on the first cement job on the pad (Temperature Log). If cement is below 200-foot cement coverage requirement, adjust cement volume to compensate for low TOC/cement coverage.

24. 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, Will Howell/Todd Sieber, 2300 River Frontage Road, Silt, CO 81652. Contact Todd Sieber at 970-876-9063 or asieber@blm.gov for clarification.
25. Submit the (a) mud/drilling log (e.g. Pason disc), (b) driller's event log/operations summary report, (c) production test volumes, (d) directional survey, and (e) Pressure Integrity Test results within 30 days of completed operations (i.e. landing tubing) per 43 CFR 3160-9 (a). Contact Will Howell for clarification.
26. 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, Will Howell 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 the well completion report.
27. During hydraulic frac operations, monitor the bradenhead/casing head pressures throughout the frac job. Any sharp rise in annular pressure (+/- 40 psi or greater) will terminate the frac operations in order to determine well/wellbore integrity. Notify BLM CRVFO Will Howell 970-876-9049 (office) or 970-319-5837 (cell) immediately.
28. 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.
29. Per 43 CFR 3162.4-1(c), not later than the fifth 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.