

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

## **ENVIRONMENTAL ASSESSMENT**

**NUMBER:** DOI-BLM-CO-N040-2010-0062-EA

**CASEFILE NUMBER:** Federal Lease COC07506

**PROJECT NAME:** Proposal to Drill Ten Federal Wells from Existing RMV 83-34 Pad Located on Fee Land West of Porcupine Creek.

**LOCATION:** Township 6 South (T6S), Range 94 West (R94W), Section 34, SW<sup>1</sup>/<sub>4</sub>SE<sup>1</sup>/<sub>4</sub>, Sixth Principal Meridian (Figure 1).

**LEGAL DESCRIPTIONS:** Surface and bottomhole locations of the proposed Federal wells addressed in this Environmental Assessment (EA) are listed in Table 1.

<b>Table 1. Surface and Bottomhole Locations of Proposed Wells</b>		
<i>Proposed Wells</i>	<i>Surface Locations (Section 34, T6S, R94W)</i>	<i>Bottomhole Locations (Section 3, T7S, R94W)</i>
RWF 31-3	SW <sup>1</sup> / <sub>4</sub> SE <sup>1</sup> / <sub>4</sub> , 622 feet FSL, 1801 feet FEL	NW <sup>1</sup> / <sub>4</sub> NE <sup>1</sup> / <sub>4</sub> , 811 feet FNL, 2062 feet FEL
RWF 41-3	SW <sup>1</sup> / <sub>4</sub> SE <sup>1</sup> / <sub>4</sub> , 649 feet FSL, 1801 feet FEL	NE <sup>1</sup> / <sub>4</sub> NE <sup>1</sup> / <sub>4</sub> , 661 feet FNL, 708 feet FEL
RWF 331-3	SW <sup>1</sup> / <sub>4</sub> SE <sup>1</sup> / <sub>4</sub> , 607 feet FSL, 1863 feet FEL	NW <sup>1</sup> / <sub>4</sub> NE <sup>1</sup> / <sub>4</sub> , 204 feet FNL, 2090 feet FEL
RWF 332-3	SW <sup>1</sup> / <sub>4</sub> SE <sup>1</sup> / <sub>4</sub> , 619 feet FSL, 1834 feet FEL	SW <sup>1</sup> / <sub>4</sub> NE <sup>1</sup> / <sub>4</sub> , 1506 feet FNL, 1972 feet FEL
RWF 341-3	SW <sup>1</sup> / <sub>4</sub> SE <sup>1</sup> / <sub>4</sub> , 656 feet FSL, 1807 feet FEL	NE <sup>1</sup> / <sub>4</sub> NE <sup>1</sup> / <sub>4</sub> , 345 feet FNL, 659 feet FEL
RWF 342-3	SW <sup>1</sup> / <sub>4</sub> SE <sup>1</sup> / <sub>4</sub> , 639 feet FSL, 1812 feet FEL	SE <sup>1</sup> / <sub>4</sub> NE <sup>1</sup> / <sub>4</sub> , 1312 feet FNL, 676 feet FEL
RWF 431-3	SW <sup>1</sup> / <sub>4</sub> SE <sup>1</sup> / <sub>4</sub> , 646 feet FSL, 1818 feet FEL	NW <sup>1</sup> / <sub>4</sub> NE <sup>1</sup> / <sub>4</sub> , 446 feet FNL, 2268 feet FEL
RWF 432-3	SW <sup>1</sup> / <sub>4</sub> SE <sup>1</sup> / <sub>4</sub> , 604 feet FSL, 1851 feet FEL	SW <sup>1</sup> / <sub>4</sub> NE <sup>1</sup> / <sub>4</sub> , 1756 feet FNL, 2030 feet FEL
RWF 441-3	SW <sup>1</sup> / <sub>4</sub> SE <sup>1</sup> / <sub>4</sub> , 644 feet FSL, 1806 feet FEL	NE <sup>1</sup> / <sub>4</sub> NE <sup>1</sup> / <sub>4</sub> , 997 feet FNL, 660 feet FEL
RWF 531-3	SW <sup>1</sup> / <sub>4</sub> SE <sup>1</sup> / <sub>4</sub> , 637 feet FSL, 1829 feet FEL	NW <sup>1</sup> / <sub>4</sub> NE <sup>1</sup> / <sub>4</sub> , 1176 feet FNL, 1941 feet FEL

**APPLICANT:** Williams Production RMT Company. Contact: Howard Harris, 1515 Arapaho Street, Tower 3, Suite 1000, Denver, Colorado 80202.

### **PROPOSED ACTION**

Williams Production RMT Company (“Williams”) proposes to drill and develop ten Federal oil and gas wells from the existing RMV 83-34 wellpad located on Fee land east of Porcupine Creek, about 6 miles southeast of Rulison, Garfield County, Colorado. The Federal wells would be directionally drilled into Federal mineral estate in Section 3, south of the pad (Figure 2). The pad and access road are located on Fee (private surface, private minerals) land along with the access to the pad in Section 34, T6S, R94W. The Federal wells would be drilled directionally from the pad into Federal lease COC07506. The pad has 18 existing wells drilled into Fee minerals. Lease terms applicable to the wells are presented in the Lease Stipulations section.

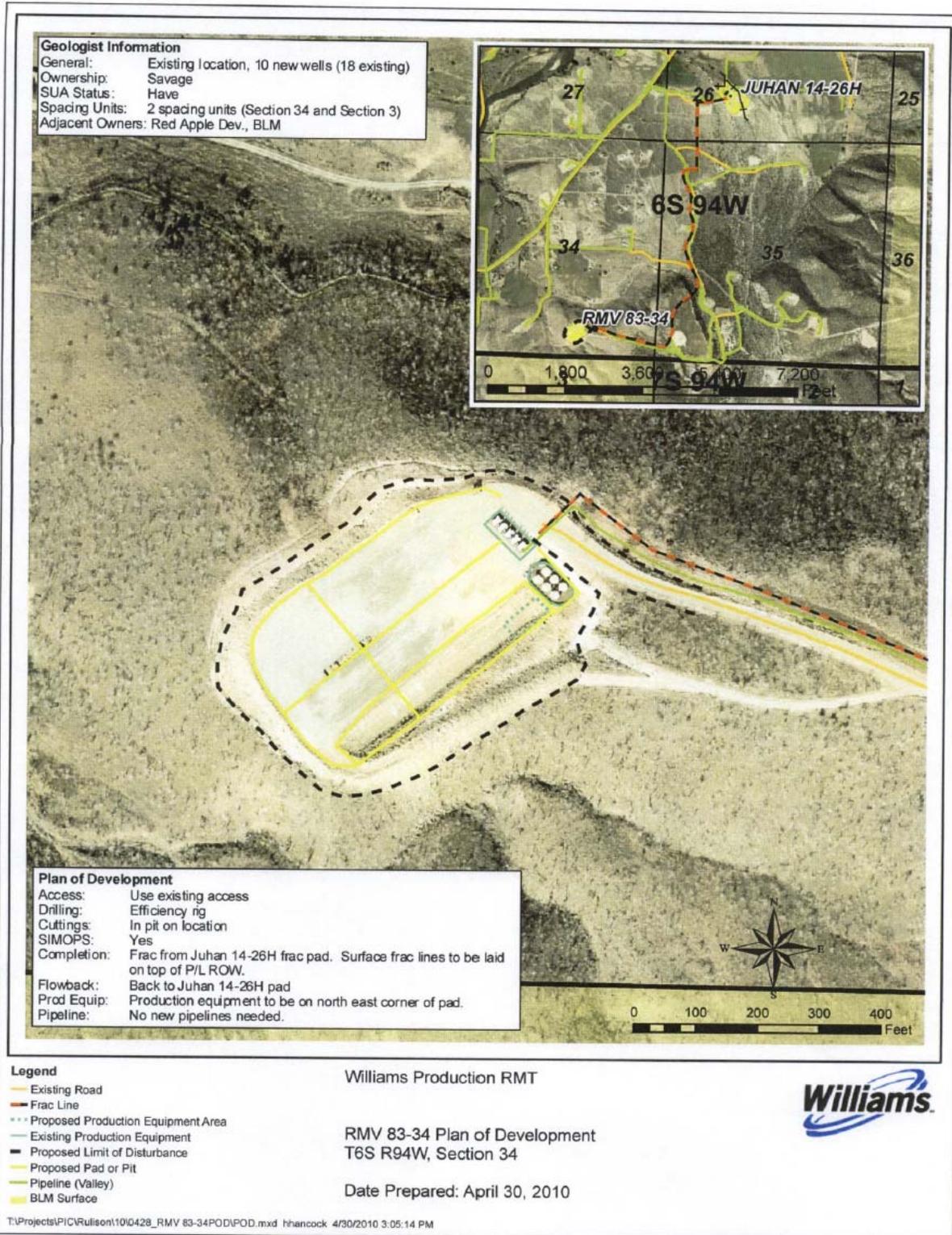


Figure 1. RMV 83-34, Existing Location.

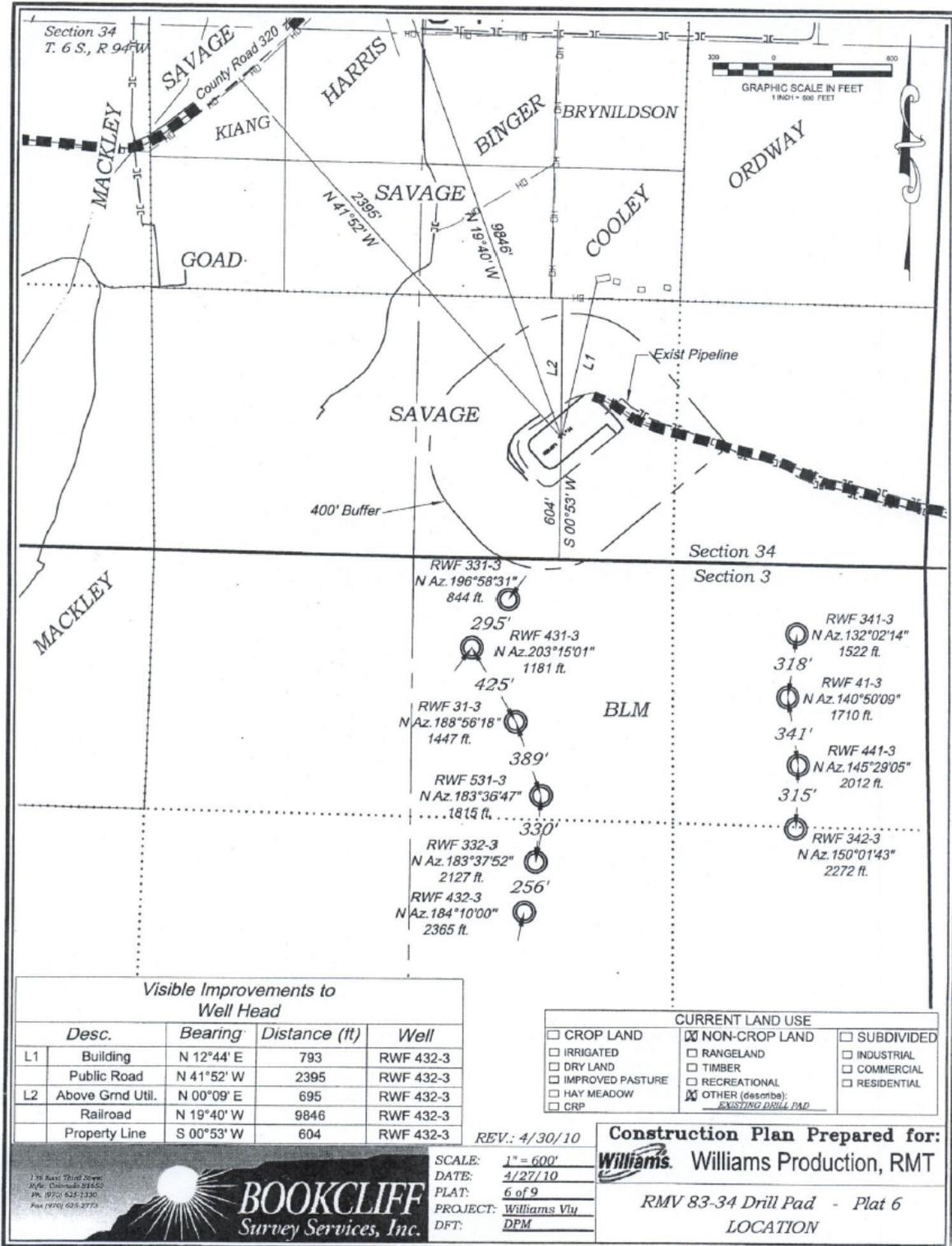


Figure 2. RMV 83-34 Pad, Well Bottomhole Locations (Circles) Relative to Surface Location.

The pad is situated on a north-facing bench between Porcupine and Spruce Creeks. A pipeline gathering system is in place along the road that services the existing Fee wells on the pad. The existing pad lies within an area that burned 5 to 6 years previously and historically was an open pinyon/juniper woodland with a sagebrush vegetation community with associated forbs and grasses in the understory. It is now a perennial and annual grass mixed community with scattered sagebrush and rabbitbrush throughout.

The project area is accessed from the intersection of State Highway 6 (SH6) and County Road 323 (CR323) north of Rulison. From that point, the route proceeds south along CR323 for 1.1 miles to the intersection with CR309, then left for 2.3 miles to the intersection with CR320, then right for 2.4 miles to the intersection with CR325, and then right (south) for 1.4 miles to the intersection with a dirt/gravel road. The pad is located 0.6 mile from CR325 on the dirt/gravel road. Public access is available to the pad vicinity along the county roads listed above. However, from the intersection with the dirt/gravel road to the pad, access is across private property and not open to the public.

No new pipelines would be needed for gas gathering, since this is an existing pad with 18 existing wells. A buried 8-inch natural gas pipeline and buried 4-inch water pipeline are in place along the access road. Water used in drilling would be trucked via existing county, state, and/or lease roads from approved water sources. Completions operations would occur offsite at the existing Juhan 14-26H frac pad. Frac (hydraulic fracturing) water would be supplied to the frac pad from an existing 10-inch water supply line. This line ties into an existing line that ultimately supplies water from the Rulison Evaporation Pond located in the SW<sup>1</sup>/<sub>4</sub>, Section 20, T6S, R94W. Three 4.5-inch surface frac lines are in place from completion activities for the 18 existing wells. These frac lines follow rights-of-way on Fee surface and along the access road to the Juhan 14-26H frac pad.

The wells would be simultaneously drilled and completed using efficiency rig techniques; drill cuttings from the proposed ten wells would be deposited in the existing cuttings trench along the southwestern side of the pad. The completion work would occur on the pad with frac water from a surface line coming from the Juhan 14-26H frac pad, approximately 1.5 miles in length. Separators for the existing wells are located on the pad, staged on the northeastern corner. Additional separators would be needed to accommodate the ten proposed Federal wells. During the onsite visit, it was determined that the cuttings trench would be of adequate size to accommodate the cuttings from the ten proposed wells. It was also determined that additional production equipment would need to be added. Placement of the additional production equipment would be on the northeastern corner of the pad, on top of the cuttings trench after it has been closed and reclaimed. Placing the production equipment on the closed and reclaimed trench would allow for the additional fill area of the pad to be put into interim reclamation. The northwestern edge of the pad would be pulled back and used for recontouring during interim reclamation. Condensate (liquid hydrocarbons coming to the surface with the produced water) would be collected in tanks on the pad and trucked off the location.

The surface disturbance of the existing pad is 4.95 acres. The size of the existing pad would be large enough to accommodate the additional ten Federal wells and cuttings from those wells in the cuttings trench. Therefore no new surface disturbance would be needed. The long-term disturbance of the pad would be 1.98 acres after interim reclamation. The road would not undergo final reclamation until the wells are plugged and abandoned. The maintenance and reclamation of the road would adhere to the Best Management Practices (BMPs) outlined in BLM's Gold Book, *Surface Operating Standards for Oil and Gas Exploration and Development* (BLM 2007).

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 intermediate 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 surface-use Conditions of Approval (COAs) to be implemented to avoid or minimize adverse impacts associated with the ten Federal wells. The operator would be responsible for continuous inspection and maintenance of the access road, pad and pipeline.

### **NO ACTION ALTERNATIVE**

The Proposed Action involves Fee surface with underlying Fee minerals and directional Federal minerals subsurface encumbered with Federal oil and gas leases that grant the lessee a right to explore and develop the leases. Although BLM cannot deny the right to drill and develop the leasehold, individual APDs can be denied to prevent unnecessary and undue degradation. The No Action alternative constitutes denial of the APDs associated with the Proposed Action. Under the No Action alternative, none of the proposed Federal wells would be drilled. The infrastructure is already in place, wellpad, roads and pipelines, due to the existing Fee wells.

### **SUMMARY OF LEASE STIPULATIONS**

The Federal lease within the project area was issued prior to any NEPA regulations and stipulations. Their effective lease date for Federal lease COC07506 is February of 1955. Although no special stipulations or notices are included on the lease, any protective measures deemed appropriate by the BLM could be applied to developments on this lease through the application of COAs on individual APDs.

### **PURPOSE AND NEED FOR THE ACTION**

The purpose of the action is to develop oil and gas resources on Federal lease COC07506 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.

### **PLAN CONFORMANCE REVIEW**

The Proposed Action is subject to and has been reviewed for conformance with the following plan (43 CFR 1610.5, BLM 1617.3):

Name of Plan: Glenwood Springs Resource Management Plan (BLM 1984).

Dates Amended: November 1991 – Oil and Gas Plan Amendment to the Glenwood Springs Resource Management Plan; March 1999 – Oil & Gas Leasing & Development Record of Decision and Resource Plan Amendment (BLM 1999).

Decision Number/Page: Record of Decision, Glenwood Springs Resource Management Plan Amendment, November 1991, page 3.

Decision Language: “697,720 acres of BLM-administrated 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.” This decision was carried forward unchanged in the 1999 RMP amendment (BLM 1999).

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

**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 the Proposed Action or alternatives being analyzed would result in impacts that 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 LHA (BLM 2004). These analyses are presented below.

**AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

This section provides a description of the human and natural environmental resources that could be affected by the Proposed Action and No Action alternative. In addition, the section presents comparative analyses of the direct and indirect consequences on the affected environment stemming from the implementation of the various actions.

A variety of laws, regulations, and policy directives mandate the evaluation of the effects of a Proposed Action and alternative(s) on certain critical environmental elements. Some of the critical elements that require inclusion in this EA are not present; others may be present but would not be affected by the Proposed Action and alternative (Table 3). Only the mandatory critical elements that are present and affected are described in the following narrative.

<b>Table 3. Critical Elements of the Human Environment</b>									
<i>Critical Element</i>	<i>Present</i>		<i>Affected</i>		<i>Critical Element</i>	<i>Present</i>		<i>Affected</i>	
	<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>		<i>Yes</i>	<i>No</i>	<i>Yes</i>	<i>No</i>
Air Quality	X		X		Prime or Unique Farmlands		X		X
Areas of Critical Environmental Concern		X		X	Special-status Species*		X		X
Cultural Resources	X			X	Wastes, Hazardous or Solid	X		X	
Environmental Justice		X		X	Water Quality, Surface and Ground*	X		X	
Floodplains		X		X	Wetlands and Riparian Zones*		X		X
Invasive, Non-native Species	X		X		Wild and Scenic Rivers		X		X
Migratory Birds	X		X		Wilderness and Wilderness Study Areas		X		X
Native American Religious Concerns		X		X					
* Public Land Health Standard									

In addition to the mandatory critical elements are other resources that would be affected by the Proposed Action and the No Action alternative. These are presented under **Other Affected Resources**.

**CRITICAL ELEMENTS**

**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 (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter less than 10 microns (µ) in diameter (PM<sub>10</sub>) and less than 2.5 µ in diameter (PM<sub>2.5</sub>), and sulfur dioxide (SO<sub>2</sub>).

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. Table 4 presents regional background values in comparison to established standards. 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. Incremental increases in PSD Class I areas are strictly limited, while greater incremental increases are allowed in PSD Class II areas.

<b>Table 4. Air Pollutant Background Concentrations, Colorado and National Ambient Air Quality Standards, and Prevention of Significant Deterioration Increments</b>					
<b>Pollutant/Averaging Time</b>		<b>Measured Background Concentration</b>	<b>Colorado and/or National AAQS</b>	<b>Incremental Increase Above Legal Baseline PSD Class I/ II</b>	
Carbon Monoxide (CO) <sup>1</sup>	1-hour	1,160 µg/m <sup>3</sup>	40,000 µg/m <sup>3</sup> (35 ppm)	n/a	n/a
	8-hour	1,160 µg/m <sup>3</sup>	10,000 µg/m <sup>3</sup> (9 ppm)	n/a	n/a
Nitrogen Dioxide (NO <sub>2</sub> ) <sup>2</sup>	Annual	10 µg/m <sup>3</sup>	100 µg/m <sup>3</sup> (0.053 ppm)	2.5 µg/m <sup>3</sup>	25 µg/m <sup>3</sup>
Ozone <sup>3</sup>	8-hour	0.076 ppm (highest)	0.075 ppm	n/a	n/a
Particulate Matter (PM <sub>10</sub> ) <sup>1</sup>	24-hour	114 µg/m <sup>3</sup> (highest)	150 µg/m <sup>3</sup>	8 µg/m <sup>3</sup>	30 µg/m <sup>3</sup>
Particulate Matter (PM <sub>2.5</sub> ) <sup>4</sup>	24-hour	40 µg/m <sup>3</sup> (highest)	35 µg/m <sup>3</sup>	n/a	n/a
	Annual	11.2 µg/m <sup>3</sup>	15 µg/m <sup>3</sup>	n/a	n/a
Sulfur Dioxide (SO <sub>2</sub> ) <sup>5</sup>	3-hour	24 µg/m <sup>3</sup>	1,300 µg/m <sup>3</sup> (0.5 ppm)	25 µg/m <sup>3</sup>	512 µg/m <sup>3</sup>
	24-hour	13 µg/m <sup>3</sup>	365 µg/m <sup>3</sup> (0.14 ppm)	5 µg/m <sup>3</sup>	91 µg/m <sup>3</sup>
	Annual	5 µg/m <sup>3</sup>	80 µg/m <sup>3</sup> (0.03 ppm)	2 µg/m <sup>3</sup>	20 µg/m <sup>3</sup>

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

The project region is classified as PSD Class II. PSD Class I areas located within 100 miles of the project area are Flat Tops Wilderness (approximately 25 miles north), Maroon Bells – Snowmass Wilderness (approximately 35 miles south), West Elk Wilderness (approximately 60 miles southeast), Black Canyon of the Gunnison National Monument (approximately 65 miles south), and Eagles Nest Wilderness

(approximately 60 miles east). Dinosaur National Monument (approximately 80 miles northwest) is listed as PSD Class II but is regulated by CDPHE as PSD Class I for SO<sub>2</sub>. Regional background pollutant concentrations and applicable standards or limits are listed in Table 4.

### Environmental Consequences

#### *Proposed Action*

CDPHE has been delegated by the U.S. Environmental Protection Agency (EPA) as the primary air quality regulatory agency in the state of Colorado, pursuant to the EPA-approved State Implementation Plan (SIP). BLM is not involved in air quality permitting or monitoring for oil and gas activities in the state of Colorado but instead defers to CDPHE under its delegated authority from EPA.

Air quality would decrease during drilling of the proposed Federal wells. No construction-related pollutants (including fugitive dust and emissions from construction equipment) would occur, since the pad and access road area existing and would not be expanded. Some temporary increases in fugitive dust would result from the additional vehicle traffic associated with mobilization and rigging up for drilling. Mobilization activities would occur between 7:00 a.m. and 6:00 p.m. each day for a period of approximately 1 week. Fugitive dust from mobilization and rigging up would be mitigated by application of water and/or other dust suppressants; increases in dust are expected to be relatively minor and short lived.

Emissions of volatile organic compounds (VOCs) are dependent on the characteristics of the condensate, tank operations, and production. Air impacts associated with the condensate tanks are expected to be anticipated to be minor; VOC emissions would be controlled as required under CDPHE Regulation 7, which specifies that vapor emissions from tanks be captured and thermally destroyed. This requirement is applied by the Colorado Oil and Gas Conservation Commission (COGCC) through its review and approval process for all oil and gas wells, including Federal wells, whether on Federal or private surface.

The Roan Plateau RMPA/EIS describes potential effects from oil and gas development (BLM 2006:4-26 to 4-37). Air quality analyses in that plan included modeling of near-field and far-field concentrations of criteria pollutants (PM<sub>10</sub>, PM<sub>2.5</sub>, CO, SO<sub>2</sub>, and NO<sub>2</sub>) and hazardous air pollutants (HAPs)(benzene, ethylbenzene, toluene, and xylenes [BTEX], formaldehyde, and hydrogen sulfide). Sulfur and nitrogen deposition, acid neutralizing capacity, and a visibility screening analysis were also completed in the Roan Plateau RMPA/EIS. Because the visibility screening analysis showed potential impacts at one or more PSD 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/EIS was calculated as having no or negligible long-term adverse impacts on air quality. The Proposed Action is within the scale of development anticipated in the cumulative impact analysis under the Roan Plateau RMPA/EIS.

Activities described in the Proposed Action would result in localized short-term increases in emissions from vehicles and drilling equipment, as well as fugitive dust from use of well pads, access roads, and pipelines. These emissions are expected to be below applicable ambient air quality standards, based on the relatively small scale of the project and abatement measures required by BLM for fugitive dust and by COGCC for VOCs from condensate tanks.

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 some to cause a net warming effect of the atmosphere primarily by decreasing the amount of heat energy re-radiated by the Earth 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 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 the effects of GHG emissions on 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. In addition, while any oil and gas leasing or development projects may contribute GHGs to the atmosphere, these contributions would not have a significant effect on a phenomenon occurring at the global scale believed by experts to be due to more than a century of human activities.

#### *No Action Alternative*

Under the No Action alternative, Federal portions of the project would not be approved or implemented. However, emissions of fugitive dust or pollutants associated with ongoing production and maintenance of the 18 existing Fee wells would continue.

### **Cultural Resources**

#### Affected Environment

Cultural resources are fragile and nonrenewable remains of prehistoric and historic human activity, occupation, or endeavor as reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features that were of importance in human history. Cultural resources comprise the physical remains themselves, the areas where significant human events occurred even if evidence of the event no longer remains, and the environment surrounding the actual resource.

Section 106 of the National Historic Preservation Act (NHPA)(P.L. 89-665; 80 Stat. 915; 16 U.S.C. 470) and its implementing regulations found at 36 CFR Part 800 require Federal agencies to take into account the effect of their actions on cultural resources for any endeavor that involves Federal monies, Federal permitting or certification, or Federal lands. For projects that extend onto private land from Federal land, or that involve Federal minerals, or that otherwise would not be feasible if all Federal involvement were eliminated, BLM considers the effects to historic properties across the entire project area regardless of surface ownership. However, guidance from the Colorado BLM State Archaeologist (dated 1/13/2005) recommends the following when dealing with directional drilling from Fee/Fee lands into Federal minerals:

- (a) When previously constructed well pad(s), access road(s), and other related improvements are used without additional expansion, no additional cultural inventory is required to assess the potential adverse effects to historic properties.

- (b) When previously constructed well pad(s), access road(s), and other related improvements are expanded and used, cultural inventory is required to assess the potential adverse effects to historic properties.
- (c) When new pad(s), access road(s), and other related improvements are constructed, cultural inventory work is required to assess the potential adverse effects to historic properties.

In summary, guidance from the Colorado BLM State Archaeologist recommends that because the existing pad will be able to accommodate the ten proposed new wells without additional expansion of the pad, access road, or pipelines, no cultural inventory is required to assess the potential adverse effects to historic properties.

### Environmental Consequences

#### *Proposed Action*

The Proposed Action would cause increased human activity in the vicinity of the existing pad in the form of project workforce, particularly during drilling and completion activity. Increased human activity due to the Proposed Action has the potential to increase the risk of disturbance, vandalism, collection, or excavation at known or undiscovered cultural resources sites in the project area.

The following mitigation measures would be implemented to minimize the potential for incidental impacts to cultural resources. A standard education/discovery COA for cultural resource protection along with the Colorado State Statute CRS 24-80-1301 for Historic, Prehistoric, and Archaeological Resources, and for Unmarked Human Graves would be attached to the APD (Appendix A).

Though project activity itself may not physically impact cultural resources, construction in proximity to a cultural resource may in fact adversely impact the significance of a cultural resource by changing the setting, location, association, and Feeling particularly for culturally sensitive Native American sites and/or areas of concern. These changes may not be quantifiable at the level of individual sites, but the cumulative effects of these changes over time will result in degradation of the condition and integrity of setting, location, association, and Feeling for which the surrounding landscape is a part of the site's significance.

No formal consultation was initiated with the Colorado State Historic Preservation Officer, because no historic properties are known in the project area, and no additional ground disturbing activity would take place beyond the existing pad footprint. The BLM has therefore made a determination of "No Historic Properties Affected" for Williams's proposed activities within the project area. This determination was made in accordance with the 2001 revised regulations [36CFR 800.4(d)(1)] for Section 106 of the NHPA (16U.S.C 470f), the BLM/SHPO Programmatic Agreement (1997) and Colorado Protocol (1998)].

#### *No Action Alternative:*

Because no additional development beyond the existing pad footprint would take place under this alternative, no direct impacts to cultural resources would occur. However, existing operations in the project area would not be subject to the Inadvertent Discovery clause of the NHPA, which mandates the protection of cultural resources discovered subsequent to the initiation of development activities. However, the Colorado statute (CRS 24-80-1301) for Historic, Prehistoric, and Archaeological Resources, and for Unmarked Human Graves would still apply.

## **Invasive Non-native Species**

### Affected Environment

The project area lies in an old burn, and vegetation that has established since the fire is fairly weedy. Prevalent non-native species include a high density of cheatgrass (*Anisantha tectorum*), Russian-thistle (*Salsola kali*), and tall tumble-mustard (*Sisymbrium altissimum*) surrounding the pad. Other weeds in the area include bulbous bluegrass (*Poa bulbosa*), prickly lettuce (*Lactuca serriola*), and plumeless thistle (*Carduus acanthoides*).

### Environmental Consequences

#### *Proposed Action*

Surface-disturbing activities provide a niche for the invasion and establishment of aggressive non-native species, particularly when these species are already present in the surrounding area. No new ground disturbance is proposed because the pad, road, and pipeline were previously constructed on private land in conjunction with drilling of the 18 existing Fee wells. However, invasive non-native species already present in the project area would spread if left untreated. Mitigation measures designed to minimize the spread of these species would be attached to well APDs as COAs (Appendix A).

#### *No Action Alternative*

Weed impacts under the No Action alternative would be the same as under the Proposed Action, since no new surface disturbance would occur under either alternative.

## **Migratory Birds**

### Affected Environment

The project area lies in an old burn with regrowth consisting of weeds mixed with some native vegetation. Burned snags surround the project area on three sides, with unburned pinyon-juniper woodland and sagebrush to the north. Habitats of the project area are suitable for use by a variety of migratory birds, which are protected by the Migratory Bird Treaty Act (MBTA). The MBTA prohibits harassing, injuring, or killing migratory birds, destroying active nests, or interfering with breeding. This includes activities that result in nest failure due to abandonment or reduced attentiveness by one or both adults.

Although essentially all migratory species—broadly defined to include most resident native species—are protected by the MBTA, particular focus for BLM oil and gas projects is placed on species identified by the U.S. Fish and Wildlife Service (USFWS 2008) as Birds of Conservation Concern (BCC). Species on the BCC list that may utilize the project area include the golden eagle (*Aquila chrysaetos*), flammulated owl (*Otus flammeolus*), pinyon jay (*Gymnorhinus cyanocephalus*), juniper titmouse (*Baeolophus griseus*), and Cassin's finch (*Carpodacus cassinii*). Golden eagles nest on cliffs in the region and hunt across broad areas of grassland, low shrubland, and open woodland. The flammulated owl occurs primarily in higher elevation conifers or tall oakbrush habitats but may also occur in pinyon-juniper. However, the open woodland in the project area appears marginal for this species. The same is true for the pinyon jay, but the woodland is likely to be used by the juniper titmouse. Cassin's finch nests in higher elevation conifers but may move to lower elevation pinyon-juniper during non-nesting seasons.

Non-BCC species associated with habitats present in the project area, and especially the pinyon-juniper, include Neotropical migrants such as the broad-tailed hummingbird (*Selasphorus platycercus*), western

kingbird (*Tyrannus verticalis*), Say's phoebe (*Sayornis saya*), gray flycatcher (*Empidonax oberholseri*), mountain bluebird (*Sialia sialis*), plumbeous vireo (*Vireo plumbeus*), black-throated gray warbler (*Dendroica nigrescens*), chipping sparrow (*Spizella passerina*), lark sparrow (*Chondestes grammacus*), and lesser goldfinch (*Carduelis psaltria*).

Non-BCC raptors present in the project vicinity include three long distance migrants species—the turkey vulture (*Cathartes aura*), American kestrel (*Falco sparverius*), and Swainson's hawk (*Buteo swainsoni*)—in addition to residents or short-distance migrants such as the Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*A. striatus*), red-tailed hawk (*Buteo jamaicensis*), and great horned owl (*Bubo virginiana*). All but the Swainson's hawk are common in the region, and all of the species nest primarily in trees. Nesting surveys conducted for the project in June 2010 (WestWater 2010) resulted in the identification of an active red-tailed hawk nest, containing one nestling, approximately 0.22 mile northwest of the well pad. A standard COA (Appendix A) applied by BLM to minimize the risk of failure of an active raptor nest would prohibit construction, drilling, and completion activities within 0.25 mile of the pad during the 60-day period March 1 to April 30. In conformance with the MBTA, this restriction would not apply to continuation of such activities if initiated prior to March 1.

### Environmental Consequences

#### *Proposed Action*

The Proposed Action would not result in a loss of nesting, roosting, perching, and foraging habitat for migratory birds beyond existing disturbance associated with the well pad, access road, and pipelines. Drilling, completion, and long-term production activities at the pad would cause temporary increases in disturbance associated with vehicular traffic, operation of heavy equipment, and human presence. For species sensitive to disturbance, this could cause shifts in patterns of habitat use, potentially including avoidance of areas otherwise suitable for nesting or foraging. However, because of the relatively short-term duration of drilling and completing ten wells, any such impacts would be minor and temporary.

The red-tailed hawk nest was within 0.25 mile of the proposed development, however, the nest was located in an area with considerable potential disturbance from traffic along CR 345. This would lead one to assume that the nesting pair was accustomed to disturbance in order to select that nesting site. In addition, with the discovery of the active nest, the operator agreed to not start work until the chick had fledged. If drilling and completion activities are to occur during subsequent nesting seasons, the nest should be resurveyed for the presence of nesting raptors. Timing limitations will then be considered for any active nests that might be affected.

Appendix A includes COAs intended to protect migratory birds for impacts associated with oil and gas operations.

#### *No Action Alternative*

Under the No Action alternative, the project components included in the Proposed Action would not be approved. Therefore, migratory birds would not be adversely affected beyond the existing or potential future impacts associated with long-term production and maintenance of the 18 existing Fee wells.

### **Native American Religious Concerns**

#### Affected Environment

The EA project area that includes the proposed new Federal wells is within a larger area identified by the Ute Tribes as part of their ancestral homeland. Cultural resource inventories (see **Cultural Resources**) were conducted to determine if any areas are present that might be culturally sensitive to Native Americans.

### Environmental Consequences

#### *Proposed Action*

At present, no Native American concerns have are known within the project area. 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. Standard COAs that would mitigate impacts to cultural resources are included in Appendix A.

#### *No Action Alternative*

Because no additional development beyond the existing pad footprint would take place under the No Action alternative, the project would have a lower potential than the Proposed Action for impact to unknown Native American resources. Although no direct impacts to known cultural resources would occur, cultural resources in the general area would still remain vulnerable to damage from accidental or inadvertent disturbance, increased illegal activities and natural processes. Additionally, existing operations in the project area would not be subject to the Inadvertent Discovery clause of the NHPA, which mandates the protection of cultural resources discovered subsequent to the initiation of development activities. However, the Colorado State Statute CRS 24-80-1301 for Historic, Prehistoric, and Archaeological Resources, and for Unmarked Human Graves would still apply.

### **Special-Status Species**

#### *Federally Listed, Proposed, or Candidate Plant Species*

#### Affected Environment

According to the current species list available online from the USFWS (<http://www.fws.gov/mountain-prairie/endspp/CountyLists/Colorado.pdf>), the following Federally listed, proposed, or candidate plant species may occur within or be impacted by actions occurring in Garfield County: Cathedral Bluffs meadowrue (*Thalictrum heliophilum*), Colorado hookless cactus (*Sclerocactus glaucus*), DeBeque phacelia (*Phacelia submutica*), Parachute beardtongue (*Penstemon debilis*), and Ute ladies'-tresses orchid (*Spiranthes diluvialis*).

### Environmental Consequences

#### *Proposed Action*

No habitat for Federally listed, proposed, or candidate plant species is present in the project area. Therefore, the project would have “**No Effect**” on these species.

#### *No Action Alternative*

Because of the absence of potential habitat for any Federally listed, proposed, or candidate plant species in the project area, the No Action alternative would not affect any of these species.

### ***Federally Listed, Proposed, or Candidate Animal Species***

#### Affected Environment

According to the current species list available online from the USFWS (<http://www.fws.gov/mountain-prairie/endspp/CountyLists/Colorado.pdf>), the following Federally listed, proposed, or candidate animal species may occur within or be impacted by actions occurring in Garfield County: razorback sucker (*Xyrauchen texanus*), Colorado pikeminnow (*Ptychocheilus lucius*), bonytail [chub] (*Gila elegans*), humpback chub (*Gila cypha*), greenback cutthroat trout (*Oncorhynchus clarki stomias*), Mexican spotted owl (*Strix occidentalis*), western yellow-billed cuckoo (*Coccyzus americanus*), and Canada lynx (*Lynx canadensis*).

Aquatic Vertebrates. Four species of big-river fishes—the razorback sucker, Colorado pikeminnow, humpback chub, and bonytail, all Federally listed as endangered—occur within the Colorado River drainage basin 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 SH13 bridge at the town of Rifle. The project area is within approximately 1 mile of this portion of the Colorado River. The nearest known habitat for the humpback chub and bonytail is in the Colorado River approximately 80 miles downstream from the project area. Only one population of humpback chub, at Black Rocks west of Grand Junction, is known in Colorado.

The greenback cutthroat trout, Federally listed as threatened, is a subspecies of cutthroat trout native to the eastern slope of Colorado (Platte River drainage). Its presence in some streams of Garfield County suggest that either fish were intentionally removed from east-slope waters and stocked in west-slope waters, or that the genetics of this species and the Colorado River cutthroat trout (the subspecies native the western slope) are not clearly defined. The greenback cutthroat trout is not known or expected to occur within or near the project area and therefore is not addressed further.

Terrestrial Vertebrates. None of the Federally listed, proposed, or candidate terrestrial wildlife species that occur or are potentially present in Garfield County—the Mexican spotted owl, western yellow-billed cuckoo, and Canada lynx—is considered likely to occur in the project area or vicinity due to lack of habitat and/or negative results of prior surveys. Hence, these species are not considered further in this document. The bald eagle (*Haliaeetus leucocephalus*) and peregrine falcon (*Falco peregrinus*), both of which were removed from the listed of threatened or endangered species in August 2007 and August 1999, respectively, and are now classified by BLM as sensitive species (see below). Although no longer protected by the Endangered Species Act, both species remain protected by the Migratory Bird Treaty Act; the bald eagle is also protected by the Bald and Golden Eagle Protection Act.

#### Environmental Consequences

##### *Proposed Action*

Endangered Colorado River Fishes. Because the ten new Federal wells would not require expansion of the existing pad, no increased potential for soil erosion and sediment transport to the Colorado River would result from the Proposed Action. In any event, the endangered big-river fishes are adapted to the naturally high sediment loads in the Colorado River, and any increase in sediments associated with oil and gas projects is unlikely to be discernible or have an adverse impact.

Releases of chemical pollutants into the river could potentially affect the big-river fishes if conveyed to the Colorado River in concentrations above acute toxicity thresholds. Potential sources of chemical pollutants include leaks from trucks, drilling equipment, tanks, or pipelines. Such occurrences are rare and, when they occur, are addressed by emergency response and cleanup measures undertaken by the operators and their contractors, subject to oversight and review/approval by the BLM.

Additional potential impacts to the endangered Colorado River fishes could result from depletions in flows due to use of water from the Colorado River in drilling, hydrostatic testing of pipelines, and dust abatement of unpaved access roads. Reductions in flows in the Colorado River and major tributaries have resulted from evaporative loss from reservoirs, withdrawals for irrigation, and other consumptive uses. These depletions have affected minimum flows, as well as peak “flushing” flows needed to maintain suitable substrates for spawning.

In May 2008, BLM prepared a Programmatic Biological Assessment (PBA) addressing water-depleting activities associated with BLM’s fluid minerals program in the Colorado River Basin in Colorado. In response to BLM’s 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.

Terrestrial Vertebrates. Because no Federally listed, proposed, or candidate threatened or endangered terrestrial wildlife species are expected to occur within or otherwise be affected by activities within the project, the Proposed Action would have “**No Effect**” on these species.

#### *No Action Alternative*

Under the No Action alternative, the project components included in the Proposed Action would not be approved. Therefore, this alternative would have no impacts on Federally listed, proposed, or candidate animal species.

#### ***BLM Sensitive Plant Species***

##### Affected Environment

BLM sensitive plant species with habitat and/or occurrence records in the area 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 Bluff meadow-rue (*Thalictrum heliophilum*).

##### Environmental Consequences

#### *Proposed Action*

Because of the absence of potential habitat for any BLM sensitive plant species in the project area, no impacts to these species are anticipated.

#### *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 5.

Environmental Consequences

*Proposed Action*

For the sensitive species listed in Table 5, the minor amount of direct or indirect loss of suitable habitat, the transient nature of their potential use of the area, and the brief period of construction-related activities in any given part of the project area combine to result in negligible potential for adverse impacts. The bases for this determination are summarized below. Note that another BLM sensitive species present in the CRVFO, the Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*) is not addressed here because it does not occur in the Colorado River (the species is limited to cold, clean streams that are isolated from areas where non-native cutthroats have been stocked for recreation).

<b>Table 5. Special-Status Wildlife Species Present or Potentially Present in the Project Area</b>		
<i>Common Name</i>	<i>Habitat</i>	<i>Potential for Occurrence</i>
Fringed myotis	Breeds and roosts in caves, trees, mines, and buildings; hunts over pinyon-juniper, montane conifer, and semi-desert shrubland habitats.	Possible
Townsend's big-eared bat	Breeds and roosts in caves, trees, mines, and buildings; hunts over pinyon-juniper, montane conifer, and semi-desert shrubland habitats.	Possible
Peregrine falcon	Nests on high cliffs and hunts along rivers and lakes for waterfowl.	Not expected
Northern goshawk	Predominantly uses spruce/fir forests but will also use Douglas-fir, various pines, and aspens.	Possible winter visitor
Bald eagle	Nests and roosts in mature cottonwood forests along rivers, large streams, and lakes.	Present along Colorado River
Brewer's sparrow	Sagebrush shrublands.	Not expected
Midget faded rattlesnake	Cool deserts dominated by sagebrush and with an abundance of rock outcrops and exposed canyon walls.	Possible
Flannelmouth sucker	Generally restricted to rivers and major tributaries.	Present in Colorado River
Roundtail chub	Generally restricted to rivers and major tributaries.	Present in Colorado River

## Environmental Consequences

### *Proposed Action*

For the sensitive species listed in Table 5, the minor amount of direct or indirect loss of suitable habitat, transient nature of their potential use of the area, and relatively brief duration of the project combine to result in negligible potential for adverse impacts. The bases for this determination are summarized below. Note that another BLM sensitive species present in the CRVFO, the Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), is not addressed here because it does not occur in the Colorado River or tributary streams in the project vicinity, instead being limited to cold, clean streams that are isolated from areas where non-native cutthroats have been introduced.

Flannelmouth Sucker and Roundtail Chub. As with the ecologically similar Colorado River endangered fishes described above, the flannelmouth sucker (*Catostomus discobolus*) and roundtail chub (*Gila robusta*) are adapted to naturally high sediment loads and therefore would not be affected by increased sediment transport to the Colorado River. Furthermore, protective COAs for water quality would minimize this potential (Appendix A). However, 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.

Midget Faded Rattlesnake. This small viper, *Crotalus viridis concolor*, is generally considered a small, pale-colored subspecies of the common and widespread western (prairie) rattlesnake, although some authorities consider it and another western subspecies, the Great Basin rattlesnake (*C.v. nuntius*) to be genetically distinct. Although movement patterns of midget faded rattlesnakes are not well known, they are believed to be limited to a few hundred meters from den sites. The limited distribution and small home range make this snake susceptible to impacts from human disturbance (USGS 2009). Threats include direct mortality from vehicles traveling on roads and pads, off-highway vehicle use throughout the landscape, capture by collectors, and livestock grazing. As access increases into previously undeveloped areas, the risk of encounters with humans will increase, resulting in some cases of mortality or collection.

Peregrine Falcon. Peregrine falcons nest along the Roan Cliffs in the vicinity of Anvil Points and hunt for waterfowl along the Colorado River or other birds across open terrain. The cliffs north of the project area are not known to contain nests of this species, and use of the project area very unlikely, except for infrequent, transitory overflights while traveling.

Northern Goshawk. This species (*Accipiter gentilis*) 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.).

Bald Eagle. Although bald eagles nest and roost along the Colorado River west of the project area, the potential for use of the actual project area is moderate. Any such use would most likely be by an individual hunting across large expanses of open upland habitats during winter. The project area would represent a small portion of such potential winter hunting habitat, and the reclaimed grass-forb community would provide better habitat for prey than the current shrubland types.

Fringed Myotis and Townsend's Big-eared Bat. No caves or other suitable roosting sites occur in the project area. Loss of large trees, potentially also used for roosting, would be negligible. Loss of habitat above which the bats could search for aerial prey would also be minimal, and disturbance due to construction activities would not occur at night when the bats are Feeding.

#### *No Action Alternative*

Under the No Action alternative, the project components included in the Proposed Action would not be approved. Therefore there would be no new impacts to BLM sensitive animal species.

### **Wastes, Hazardous or Solid**

#### Affected Environment

BLM Instruction Memoranda numbers WO-93-344 and CO-97-023 require that all National Environmental Policy Act (NEPA) documents list and describe any hazardous and/or extremely hazardous materials that would be produced, used, stored, transported, or disposed of as a result of a proposed project. Appendix L, Hazardous Substance Management Plan, of the Glenwood Springs Resource Area Oil & Gas Leasing & Development, Draft Supplemental Environmental Impact Statement (BLM 19988), 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 (CERCLA) (Public Law 96-510 of 1980) provides for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment. It also provides national, regional, and local contingency plans. Applicable emergency operations plans in place include the National Contingency Plan (40 CFR 300, required by section 105 of CERCLA), the Region VIII Regional Contingency Plan, the Colorado River Sub-Area Contingency Plan (these three are Environmental Protection Agency 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.
- Hazardous spill cleanup activities that fall outside the criteria set forth in CERCLA still require the submission of a Preconstruction Notice to the US Army Corps of Engineers, and may be subject to Nationwide Permit Number 38.
- 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 mobilization of the rig would include diesel fuel, hydraulic fluid, and lubricants. These materials would be used during rigging up of the drilling rig, refueling and maintaining vehicles and equipment, not for the road, pad, and pipeline because it is existing. Potentially harmful substances used in the operation 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.

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 would result in a release of any of these materials and 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, the responsible party would be liable for cleanup and 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.

#### *No Action Alternative*

The No Action alternative would result in no impacts from releases or spills of hazardous or solid wastes into the environment, because none of the project components would be built and operated.

### **Water Quality, Surface and Ground**

#### *Surface Water*

##### Affected Environment

The project area lies within Lower Colorado River Basin below Rifle 5<sup>th</sup> Code watershed, and covers portions of two 6<sup>th</sup> Code watersheds: The Spruce Creek watershed and an unnamed watershed to the west. The existing well pad is also directly in between Spruce and Porcupine Creeks and encompasses portions of at least four unnamed, ephemeral tributary streams. Spruce Creek joins the Colorado River approximately 1 mile north of the project area, and Porcupine Creek joins the Colorado River approximately 1.5 miles north. These perennial drainages contain small riparian corridors in areas consisting primarily of cottonwoods and willows. These drainages occur in well drained, loosely consolidated alluvium and could be described as moderately entrenched in the project area.

According to the *Stream Classifications and Water Quality Standards* (CDPHE, Water Quality Control Commission [WQCC] Regulation No. 37) (CDPHE 2007), Spruce Creek, Porcupine Creek, and their tributaries are within segment 4a, which includes all 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 2, 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 2 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 use.

The portions of Spruce Creek within the project area are well vegetated, with stable banks and riparian vegetation sufficient to provide cover and habitat for aquatic and riparian fauna. The portion of Porcupine Creek within the project area is very disturbed due to movement of the parent materials upstream from the site. A large outcrop of Green River shale and sandstone was uplifted and has produced a large slide area, forming the northern cliffs of Battlement Meas. As this site naturally erodes, it delivers massive amounts of shale and sandstone to Porcupine Creek. As this material makes its way down the creek, its constant shifting and bed movement preclude the establishment of hydrophytic vegetation or development of hydric soils. These drainages are not currently on the State of Colorado's *Stream Classifications and Water Quality Standards* (CDPHE 2007, WQCC Regulation No. 37) list, the State of Colorado's *303d List of Water Quality Limited Segments Requiring TMDLS* (CDPHE 2006a, WQCC Regulation No. 93), or the State of Colorado's *Monitoring and Evaluation List* (CDPHE 2006b, WQCC Regulation No. 94). *Colorado's Monitoring and Evaluation List* (Regulation No. 94, CDPHE 2006b) identifies water bodies where there is reason to suspect water quality problems, but uncertainty also exists regarding one or more factors.

### Environmental Consequences

#### *Proposed Action*

Potential impacts to surface water associated with the Proposed Action include increased erosion and sedimentation of streams due to truck traffic and road maintenance operations, and contamination by drilling fluids, produced water, or condensate.

Surface waters would be most susceptible to sedimentation during drilling and completion activities, which would collectively last approximately 60 to 90 days. After this period, reclamation activities would substantially reduce surface exposure, decreasing the risk to surface waters over the long term.

The existing access road to well pad RMV 83-34 crosses two unnamed ephemeral drainages in the southern part of the project boundary. Although surface waters would be 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 and preventive measures.

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. The reserve pit used to contain drilling fluids would be lined to prevent infiltration into surrounding soils. Once completion operations are complete, excess liquids would be allowed to evaporate and the pit would be backfilled in a manner that would avoid incorporating the mud into surface soils.

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 to prevent migration to surrounding soils or surface waters. Pipelines associated with the transport of these liquids would be pressure tested to detect leakage prior to use.

Through the use of BMPs and other COAs associated with 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*

Because the No Action alternative would not involve implementing any of the project components, it would result in no adverse impacts to surface waters.

#### ***Waters of the U.S.***

##### Affected Environment

Waters of the United States located in the project area include ephemeral tributaries to Spruce Creek. 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 pad expansion proposed that could discharge fill into Waters of the U.S.

Improperly designed crossings of small ephemeral drainages, in particular any undersized or poorly aligned culverts, could result in soil degradation, including erosion at culvert outlets. This could potentially supply sediment to the Colorado River approximately 1 mile to the north. 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. potentially impacted by stormflow runoff from the pad.

#### *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 accompany this alternative beyond those associated with ongoing production and maintenance operations for the 18 existing Fee wells.

#### ***Groundwater***

##### Affected Environment

Project activities would be located within the Lower Piceance Basin aquifer system (Colorado Geological Survey 2003), which contains both alluvial and bedrock aquifers. Unconsolidated alluvial aquifers are the most productive aquifers in the region (EPA 2004), and are made up of narrow, thin deposits of sand and gravel that form primarily along stream courses. The major alluvial aquifer in the region is the Colorado River and its tributaries. Generally, alluvial well depths are less than 200 feet, and typical water levels range from 50 to 100 feet. The quality of alluvial groundwater in the Colorado River Basin can vary widely, being affected by return flow quality, mineral weathering and dissolution, cation-anion exchange with alluvial minerals, and organic compound loading from fertilizer and pesticide leaching.

The principal bedrock aquifers of the basin are the Uinta Formation and the Parachute Creek Member of the Green River Formation. These two aquifer systems are bounded on the north by the White River and on the south by the Colorado River. South of the Colorado River, these upper Tertiary-age aquifers have largely been eroded off, exposing the lower Green River and Wasatch Formations. The Wasatch Formation is the basal confining unit of the upper and lower bedrock aquifer systems. Below the Wasatch Formation is the Mesaverde aquifer. This aquifer consists of sandstone with interbedded shale and coal of the Williams Fork Formation and the marine sands and shales of the Iles Formation. The depth to the top of this aquifer beneath the project area is more than 4,000 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.

Most of the groundwater recharge is provided by winter precipitation and stored as snowpack at the higher elevations within the basin. In the summer, little, if any rainfall infiltrates into the groundwater saturated zone (Glover et al. 1998). Most precipitation is lost to evapotranspiration, with estimates of loss as high as 98% (Taylor 1987, cited in CGS 2003). Recharge flows from recharge areas near the margins of the basin to discharge areas near principal stream valleys.

Water quality in the Piceance Basin is generally poor overall because of nahcolite deposits and salt beds present within 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). Published water quality data for alluvial aquifers usually include concentrations of total dissolved solids (TDS), a measure of the amount of dissolved minerals and organic material in the water, and is usually equated to salinity. Flows associated with hot springs typically have high TDS concentrations, as is the case with Glenwood Hot Springs. According to Barrett and Pearl (1978), TDS values ranging from 17,600 to 21,500 milligrams per liter (mg/L) were measured at discharge points from the hot springs. As a result, alluvium downstream from Glenwood Springs has elevated TDS levels, contributing annually up to 534,000 tons of dissolved solids into the Colorado River (Apodaca et al. 1996). In contrast, EPA's secondary drinking water standard for TDS is 500 mg/L. Even with high TDS values, surface water quality generally meet state and Federal standards for drinking water (Spahr et al. 2000).

According to the Colorado Division of Water Resources (DWR), one fresh-water well is present within a 0.25-mile radius of the proposed activities, with an additional seven within a 0.5-mile radius. The closest well is located approximately 1,400 feet north and slightly east of the existing pad. This 163-foot-deep deep domestic well lists a static water level of 145 feet and a well yield of 15 gallons per minute (GPM), the statutory limit on domestic water well withdrawals.

Static water levels in alluvial deposits are related to the adjacent river or creek stage. Generally, the alluvial water levels will be high in the spring and early summer due to snowmelt and increased runoff, dropping through the summer and fall, and will remain low throughout the winter. The identified wells found within a 0.5-mile radius of the RMV #83-34 well pad are located predominately northwest, within the Spruce Creek drainage. Additional fresh-water wells are found farther east, closer to a mile away, along Porcupine Creek and its tributaries. A cross section of the wells identified within the 0.5-mile buffer were analyzed for well parameters and indicate well depths ranging from 80 feet to 140 feet, with accompanying static water levels ranging between 49 feet and 109 feet. Well yields were good, averaging between 5 and 15 gpm. Confirmation of shallow well depths and water levels for these wells indicates completion in the alluvium along stream courses, typical for most water wells in this part of the Basin.

### 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. Proppants, or propping agents are mixed with both fresh and produced water, and typically include sand, aluminum, glass, or plastic beads, with minor amounts, 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 Appendix A regarding cementing and casing programs).

*No Action Alternative*

Under the No Action alternative, the proposed development project would not be approved. As a result, no impacts to groundwater resources within the development area would occur beyond the potential impacts associated with ongoing production and maintenance of the 18 existing Fee wells.

**OTHER AFFECTED RESOURCES**

In addition to the critical elements, the resources presented in Table 6 were considered for impact analysis relative to the Proposed Action and No Action alternative. Resources that would be affected by the Proposed Action and No Action alternative are discussed below.

<b>Table 6. Other Resources Considered in the Analysis</b>			
<i>Resource</i>	<i>NA or Not Present</i>	<i>Present but Not Affected</i>	<i>Present and Affected</i>
Access and Transportation			X
Cadastral	X		
Fire/Fuels Management	X		
Forest Management	X		
Geology and Minerals			X
Law Enforcement	X		
Paleontology		X	
Noise			X
Range Management	X		
Realty Authorizations	X		
Recreation	X		
Socio-Economics			X
Soils			X
Vegetation			X
Visual Resources		X	
Wildlife, Aquatic			X
Wildlife, Terrestrial			X

## Access and Transportation

### Affected Environment

The project area is accessed from the intersection of SH6 and CR323 north of Rulison. From that point, the route proceeds south along CR323 for 1.1 miles to the intersection with County CR309, then left for 2.3 miles to the intersection with CR320, then right for 2.4 miles to the intersection with CR325, and then right (south) for 1.4 miles to the intersection with a dirt/gravel road. The pad is located 0.6 mile from CR325 on the dirt/gravel road. Public access to the project vicinity is available along the county roads listed above. However, from the intersection with the dirt/gravel road to the pad, access is across private property and not open to the public. The existing access roads would provide access to the area in its present condition and alignment.

### Environmental Consequences

#### *Proposed Action*

The Proposed Action would result in a substantial temporary increase in truck traffic and a less substantial long-term increase compared to existing traffic associated with the 18 Fee wells. The greatest increase would be during rig-up, drilling, and completion activities. An estimated 1,160 truck trips over a 30-day period would be required to support the drilling and completion of each well (Table 7). Once all of the wells are in production, traffic would decrease to occasional visits for monitoring or maintenance activities. Each well is assumed to require recompletion once per year. Each recompletion would require three to five truck trips per day for approximately 7 days. Since fluids generated during the lives of the wells would be transported via buried lines to tank facilities near the I-70 frontage road, water and oil truck traffic related to haulage of fluids would be drastically reduced.

<i>Vehicle Class</i>	<i>Number of 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 conditions of approval to ensure adequate dust abatement and road maintenance occur.

#### *No Action Alternative*

This alternative would not affect access or transportation other than those associated with the long-term production and maintenance of existing Fee wells on the pad.

## Geology and Minerals

### Affected Environment

The RMV 83-34 pad is located along the southern edge of the Piceance Basin on the northern side of Battlement Mesa. Battlement Mesa is a large, prominent highland that stretches for approximately 20 miles east-west and sits along the Garfield-Mesa county line between the Colorado River to the north and Plateau Creek to the south. It is visible similar in geology to the nearby Grand Mesa to the southwest, consisting largely of basalt-capped sedimentary rocks of the Green River and Uinta Formations. The lower part of the Green River Formation is visible along the flanks of Battlement Mesa but mostly cloaked by landslide deposits in the vicinity of the site. Table 8 lists the formations that crop out along or near the project site.

<b>Table 8. Geologic Formations within the Study Area</b>				
<i>Map Symbol</i>	<i>Formation Name</i>	<i>Age</i>	<i>Characteristics</i>	<i>Location</i>
Ql	Landslide deposits	Holocene	Large slump block basalt irregularly veneered with young glacial drift	Mesa tops and flanks
Qg	Young gravels (Bull Lake and younger)	Pleistocene	Stream, terrace, and outwash gravels	Stream valleys
Qgo	Old gravels and alluviums	Pleistocene	Terrace, outwash, and pediment gravels	Stream valleys
Tu	Uinta Formation	Eocene	Siltstone, sandstone and marlstone	Flanks of Battlement Mesa
Tbb	Basalt flows	Miocene and Pliocene	Dense black resistant alkali basalt in lava-flow layers and volcanic conglomerates	Grand and Battlement Mesas
Tgp	Parachute Creek Member of Green River Fm	Eocene	Gray and yellow-brown marlstone and tuff and Mahogany oil shale bed	Flanks of Battlement Mesa
Tgg	Garden Gulch Member of Green River Fm	Eocene	Dark brown and gray flaky shale and brown sandstone and limestone	Flanks of Battlement Mesa
Tgl	Lower part of Green River Fm	Eocene	Shale, sandstone, and marlstone	Mesa tops
Two	Wasatch Formation	Paleocene, Eocene	Red, gray, and brown sandstone and siltstone and red, green, and gray shale	Prominent exposures north of the Colorado River and east of site
Source: Tweto et al. 1978, Ellis and Freeman 1984, Shroba and Scott 1997				

The Mesaverde Group is the target zone of the proposed drilling program. Comprising the Iles and Williams Fork Formations, the Mesaverde Group is composed of marine sandstones transitional to non-marine beds of coal, shale, and sandstone that were deposited marginal to the great Cretaceous seaway (Warner 1964) that occupied much of the Western Interior region during that time. 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.

The orogenic (mountain-building) processes that also took place during the late Cretaceous produced uplift and subsidence structures in central and eastern Utah, western Colorado, and most of Wyoming (USGS 2009). As the highland areas were exposed to erosion and the basin deepened, a greater amount of sediment was available for deposition along the ancient shoreline. The subsequent facies changes that occurred as a result of these two processes are believed to be the trapping mechanism that defines the extensive gas accumulation of the Williams Fork Formation. 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 tight gas is both stratigraphic and diagenetic.

Production is derived from three reservoir intervals, which include the Wasatch Formation, the Williams Fork Formation, and Iles Formation. The latter two make up the Upper Cretaceous Mesaverde Group. Mesaverde Group reservoirs are tight throughout most of the Piceance Basin, and generally become tighter with depth of burial (Spencer, 1983). 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 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.

### Environmental Consequences

#### *Proposed Action*

Implementation of the proposed development program would result in natural gas and associated water being produced from the tight gas sands of the Mesaverde Group. 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). If the wells become productive, initial production rates would be expected to be highest during the first few years of production, then steadily decline during the remainder of the economic lives of the wells. Most of the wells currently in production are estimated to have a life span of 30 to 35 years. See the section on Surface Water for requirements regarding disposal of produced water.

Specific casing depths would vary depending on well location and drilling conditions. Surface casing used to protect and isolate usable water and potential production zones would be set at depths substantially below known aquifers within the area. If a water-bearing, gas-producing, lost-circulation, or pressurized zone is encountered below the surface casing, cement volumes would be adjusted to protect and further isolate those zones. This configuration is designed to prevent accidental contamination or leakage of hydrocarbons or drilling fluids from reaching usable water- or gas-producing zones within the wellbore.

#### *No Action Alternative*

Under the No Action alternative, none of the proposed development would take place. No new impacts to the geology and mineral resources would occur on Federal mineral estate.

## Noise

### Affected Environment

Noise is generally described as unwanted sound, weighted and noise intensity (or loudness) is measured as sound pressure in units of decibels (dBAs). The decibel scale is logarithmic, not linear, because the range of sound that can be detected by the human ear is so great that it is convenient to compress the scale to encompass all sounds that need to be measured. Each 20-unit increase in the decibel scale increases the sound loudness by a factor of 10.

Sound levels have been calculated for areas that exhibit typical land uses and population densities. In rural recreational areas, ambient sound levels are expected to be approximately 30 to 40 dBA (EPA 1974, Harris 1991). The Proposed Action would be located in a rural, populated area with few potential noise sources. Noise levels from human activity are mostly mechanical, consisting mainly of existing oil and gas wells, new exploration activities, and ranching/farming operations. Human noise is widely dispersed throughout the area, and there are few impacts associated with industrial noise sources and vehicular traffic. As a basis for comparison, the noise level during normal conversation of two people 5 feet apart is 60 dBA.

### Environmental Consequences

#### *Proposed Action*

The project would result in increased levels of noise during the drilling and completion phases. The noise would be most noticeable along the roads used to haul equipment and at pad location. Drilling activities are subject to noise abatement procedures as defined in the COGCC Rules and Regulations (Aesthetic & Noise Control Regulations). Operations involving pipeline or gas facility installation or maintenance, the use of a drilling rig, completion rig, workover rig, or stimulation are subject to the maximum permissible noise levels for industrial zones. The COGCC (2006) revised noise control rules call for noise levels from oil and gas operations at any well site and/or gas facility to comply with the maximum permissible levels (Table 9) at a distance of 350 feet.

<b>Zone</b>	<b>7:00 A.M. to 7:00 P.M.</b>	<b>7:00 P.M. to 7:00 A.M.</b>
Light Industrial	70 dBA	65 dBA
Residential/Agricultural/Rural	55 dBA	50 dBA

Given the location of the project in proximity to residential and agricultural structures, the residential/agricultural/rural standard is applicable. The allowable noise level for periodic impulsive or shrill noises is reduced by 5 dBA from the levels show (COGCC 2006).

Short-term (7- to 14-day) increases in nearby noise levels would characterize road and well pad construction while the existing cuttings pit is re-opened. Based on the Inverse Square Law of Noise Propagation (Harris 1991) and a typical noise level for construction sites of 65 dBA at 500 feet (Table 10), project-related noise levels would be approximately 59 dBA at a distance of 1,000 feet, approximating those of commercial areas (EPA 1974).

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 10, approximately 68 dBA of noise (at 500 feet) would be created by each

fuel and water truck that travels these roads. Less noise would be created by smaller trucks and passenger vehicles such as pickup trucks and sport utility vehicles. Although the duration of increased noise from this source would be short, it would occur repeatedly during the drilling and completion phases.

Equipment	Noise Level (dBA)		
	50 feet	500 feet	1,000 feet
Air Compressor, Concrete Pump	82	62	56
Backhoe	85	65	59
Bulldozer	89	69	63
Crane	88	68	62
Front End Loader	83	83	57
Heavy Truck	88	68	62
Motor Grader	85	65	59
Road Scraper	87	67	61
Tractor, Vibrator/Roller	80	60	54

Sources: BLM (1999a), La Plata County (2002)

Noise impacts would decrease during the production phase but would remain background noise levels. During maintenance and workovers, noise levels would temporarily increase above those associated with routine well production. Traffic noise level would impact residences located along county roads that would 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. Several residences occur within 0.5 mile of the well pad location and its access road. Noise impacts associated with the Proposed Action would be heard by the surrounding residents but would be minimal and associated with only drilling and completion activities.

*No Action Alternative*

This alternative would not have an impact on existing noise levels, because the development activities would not occur.

**Socio-Economics**

Affected Environment

The project area is located within Garfield County, Colorado. The population of Garfield County grew by approximately 2.7% per year from 2000 to 2005, resulting in an increase from 44,000 to 51,000 residents (DOLA 2007). Population growth in Garfield County is expected to more than double over the next 20 years from over 50,000 in 2005 to 116,000 in 2025 (DOLA 2007).

In the year 2000, industry groups in Garfield County with the highest percentage of total employment were construction (20.4 percent), tourism (10.7 percent), retail trade (13.7 percent), and education and health (15.4 percent). An estimated 13.3% of the population was retired in the year 2000 and did not earn wages. Employment in agriculture, forestry, hunting, and mining accounted for 2.4% of total employment.

Personal income in Garfield County has also risen, growing 120% from \$513 million in 1990 to \$1.1 billion in 2000. Annual per capita income has grown by 50% during the same period, from about \$17,000

to \$26,000 (BLM 2006), 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 eight years from 70 billion cubic feet (BCF) in 2000 to more than 376 BCF in 2008 (COGCC 2009). In addition, Garfield County is experiencing the fastest oil and gas development in Colorado with 3,000 drilling permits currently approved (COGCC 2009). 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 2007).

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 four years has been as follows: \$1,170,205 in 2004; \$808,348 in 2005; \$1,065,158 in 2006; and \$1,078,087 in 2007 (USDI 2008).

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 2007, oil and gas assessed valuation in Garfield County amounted to approximately \$1.9 billion, or about 65% of total assessed value. Total tax revenues from property taxes and special district levies were \$130 million. Tax dollar distributions in 2007 were Schools 37%, County 30%, Special Districts 13%, Fire Districts 10%, Colleges 8%, and Towns 2%.

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 State levels.

### 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.

#### *No Action Alternative*

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

## **Soils**

### Affected Environment

According to the *Soil Survey of Rifle Area, Colorado* (USDA 1985), the project would be located on the Potts-Ildefonso soil complex. This broadly defined unit consist of strongly sloping to hilly soils on mesas, alluvial fans, and sides of valley. Elevation ranges from 5,000 feet to 6,500 feet. The Potts soil formed in alluvium derived from sandstone, shale, or basalt. The Ildefonso soil formed in very strongly calcareous, basaltic alluvium and small amounts of eolian material. The Potts soil occurs on slightly concave positions and makes up about 60% of this unit. The Ildefonso soil occurs on breakers and steeper slopes and makes up about 30% of the unit.

Surface runoff for the complex is medium, and erosion hazard is moderate. Primary uses for these soils are limited grazing and wildlife habitat. The lower elevations of the complex are important wintering areas for deer.

### Environmental Consequences

#### *Proposed Action*

Since the existing pad is located on private property, approximately 4.95 acres of short-term vegetation loss and soil disturbance with a long-term disturbance of 1.98 acres, has already occurred, and no new disturbance is needed to drill the ten proposed Federal wells. In general, the area contains adequate vegetation buffers around the toe of the fill slope that would minimize the potential for sediment transport. Stormwater Best Management Practices (BMPs) are already in place around the existing pad.

Potential for soil loss and transport increasing as a function of slope, feature (pad, road or pipeline route) has already occurred.

The area disturbed is comprised of soils with moderate risks of erosion. However, the work has occurred on a bench that has proven stable since construction of the pad, road, and pipeline and drilling of the Fee wells. Because the project area is located with 1 mile from the Colorado River, the COAs for the protection of surface water quality (Appendix A) would be of particular importance.

#### *No Action Alternative*

In the No Action alternative, the project components would not occur. Therefore, this alternative would have no impact on soils beyond those that resulted from development of the 18 existing Fee wells.

### **Vegetation**

#### Affected Environment

The project area was burned in a wildfire that converted the original pinyon-juniper (*Pinus edulis-Juniperus osteosperma*) woodland into a grassland community. The grassland community is fairly weedy, with abundant cheatgrass and other annual weeds. The dominant native perennial grasses in this community include western wheatgrass (*Pascopyrum smithii*), needle-and-thread grass (*Hesperostipa comata*), bluebunch wheatgrass (*Pseudoroegneria spicata*), bottlebrush squirreltail (*Elymus elymoides*), Indian ricegrass (*Achnatherum hymenoides*), and galleta grass (*Pleuraphis jamesii*). Common native forbs include scarlet globemallow (*Sphaeralcea coccinea*) and tansy-aster (*Machaeranthera grindelioides*). Also present are broom snakeweed (*Gutierrezia sarothrae*)—a native subshrub that commonly colonizes following a fire—and scattered young sagebrush (*Artemisia tridentata*).

#### Environmental Consequences

##### *Proposed Action*

No direct effects to vegetation would occur under the Proposed Action, because it result in no new ground disturbance. However, various indirect effects such as erosion, sedimentation and weed expansion could occur. Negative impacts would be minimized by implementing the mitigation measures to be applied as COAs (Appendix A).

##### *No Action Alternative*

No new impacts to vegetation would occur under the No Action alternative, because the project would not be implemented.

### **Wildlife, Aquatic**

#### Affected Environment

Fish and aquatic macroinvertebrates are not present in proximity to the project area, due to the absence of perennial streams. However, runoff would drain to the Colorado River, which supports Federally listed and BLM sensitive fish species, as well as a variety of other fish and aquatic invertebrates.

## Environmental Consequences

### *Proposed Action*

Since no perennial streams are present near the project area, the Proposed Action would not have direct impacts on aquatic wildlife. Potential effects on fish and aquatic invertebrates due to transport of sediments to the Colorado River, which lies approximately 1 mile north of the project area, would be negligible because the project would not result in new surface disturbance.

Minor potential exists for releases of chemical pollutants to the Colorado River due to spills from trucks, tanks, or pipelines. The absence of a perennial stream near the existing pad reduces this potential significantly, as does reliance on buried pipelines rather than trucks to haul produced water and condensate. Additionally, requirements for containment rings around tanks are intended to reduce both the likelihood and potential volume of releases from tanks.

### *No Action Alternative*

Under the No Action alternative, the project components included in the Proposed Action would not be approved. Therefore, no new impacts to aquatic wildlife would result.

## **Wildlife, Terrestrial**

### Affected Environment

A large portion of the project area was burned in the 2003 Red Apple fire, which converted the original pinyon-juniper woodland into a grassland community. A smaller portion of the project area was left untouched by the fire and contains a mature stand of pinyon-juniper woodland interspersed with sagebrush. Given these vegetation types, the area provides cover, forage, and breeding sites for a variety of big game and small game species as well as nongame mammals, birds, and reptiles.

**Mammals.** The project area contains winter range and severe winter range for mule deer (*Odocoileus hemionus*) and a smaller amount of winter range for Rocky Mountain elk (*Cervus elaphus nelsoni*) as mapped by the CDOW (2009). The mule deer is a recreationally important species that is common throughout suitable habitats in the region. Although most of the area is mapped as mule deer winter range, the project area also receives use by deer during the summer. Rocky Mountain elk are also recreationally important, and the project area contains a fair amount of suitable habitat for this species.

Large carnivores potentially present in the project vicinity include the mountain lion (*Puma concolor*), which moves seasonally with its preferred prey, the mule deer, and the black bear (*Ursus americanus*). Black bears are less common in the project area due to the scarcity of sufficient forest cover and suitable foods (including acorns and berries). Two smaller 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. Also present in the CRVFO area are secretive small carnivores, the ringtail (*Bassariscus astutus*) and spotted skunk (*Spilogale gracilis*), primarily in rocky or wooded terrain. Grasslands surrounding the project site appear capable of supporting use by another small carnivore, the badger (*Taxidea taxus*).

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*) and lagomorphs such as the desert cottontail

(*Sylvilagus audubonii*) and black-tailed jackrabbit (*Lepus californicus*). Rodents and, to a lesser extent lagomorphs, are the primary prey base for a variety of avian and mammalian predators.

Birds. Passerine (perching) birds commonly found in the area in addition to those addressed previously under Migratory Birds and Special-Status Species include residents or short-distance migrants such as the western scrub-jay (*Aphelocoma californica*), black-billed magpie (*Pica pica*), common raven (*Corvus corax*), American robin (*Turdus migratorius*), Townsend's solitaire (*Myadestes townsendi*), blue-gray gnatcatcher (*Poliophtila caerulea*), mountain chickadee (*Poecile gambeli*), and house finch (*Carpodacus mexicanus*).

Reptiles and Amphibians. The project area is only marginally suitable for most of the reptile species that occur in the CRVFO area. The most likely species are the gopher snake (bullsnake) (*Pituophis catenifer*) and yellow-bellied racer (*Coluber constrictor*), both of which commonly occur in grasslands and other open or habitats such as sagebrush. The site and immediate vicinity lack sufficient habitat for any amphibian species (frogs, toads, and salamanders).

### Environmental Consequences

#### *Proposed Action*

The Proposed Action would not result in new surface disturbance, because the well pad, access road, and pipeline are already in place for the 18 existing Fee wells. Nonetheless, areas around the pad and along the access road would be subject to indirect habitat loss as a result of disturbance. Human activity, including vehicular traffic and the operation of heavy equipment, can cause deer, elk, and other species to avoid areas of otherwise suitable habitat. Even when wildlife sensitive to disturbance do not avoid an area altogether, the changes in their movement patterns can result in greater use of less suitable habitats and increased physiological stress. These impacts are more significant during critical seasons such as winter, when cold temperatures, reduced forage quality, and reduced forage availability due to snow cover deplete their energy stores accumulated during summer and fall.

To minimize potential impacts to deer and elk during the critical winter season, BLM would apply a 60-day timing limitation COA (Appendix) prohibiting construction, drilling, and completion activities during January and February of each winter. Operation and maintenance activities would be allowed.

For other types of wildlife, the extent of indirect habitat loss varies by species, the type and duration of the disturbance, and the amount of screening provided by vegetation and topography. In general, disturbance-related impacts are temporary, with patterns of distribution and habitat use returning to pre-disturbance conditions rather quickly when the disturbance stops. In the case of this project, the duration of drilling and completion activities for only ten new wells would be relatively brief.

#### *No Action Alternative*

Under the No Action alternative, the project components included in the Proposed Action would not be approved. Therefore, no impacts to terrestrial wildlife would occur in excess of any impacts associated with long-term production and maintenance of the 18 existing Fee wells.

### **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 1999: 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  
Colorado Division of Wildlife – Michael Warren  
Garfield County Oil & Gas Office Liaison – Nikki Reckles

**INTERDISCIPLINARY REVIEW**

BLM staff in the CRVFO who participated in planning for this project and preparing this EA are listed in Table 11.

<b>Table 11. BLM Interdisciplinary Team Authors and Reviewers</b>		
<i>Name</i>	<i>Title</i>	<i>Areas of Participation</i>
Rebecca Beavers	Natural Resource Specialist	EA Project Lead, Air Quality, Access and Transportation, Noise, Range Management, Socio-Economics, Soils, Water Quality
Allen Crockett	Supervisory Natural Resource Specialist/Physical Scientist	NEPA Review
Beth Brenneman	Ecologist	Invasive Non-native Species, Special-status Species (Plants), Vegetation
Sylvia Ringer	Wildlife Biologist	Migratory Birds, Special-status Species (Animals), Wildlife, Aquatic and Terrestrial
John Brogan	Archaeologist	Cultural Resources, Native American Religious Concerns
Karen Conrath	Geologist	Groundwater, Geology and Minerals
William Howell	Petroleum Engineer	Downhole COAs

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**FONSI**  
**DOI-BLM-CO-040-2010-0062-EA**

The Environmental Assessment (EA) 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 (EIS) is not necessary to further analyze the environmental effects of the proposed action.

**DECISION RECORD**

DECISION: It is my decision to approve the Proposed Action presented in the EA. The Proposed Action includes the addition of ten Federal oil and gas wells to existing Williams Production RMT Company RMV 83-34 well pad and associated maintenance of the pad, spur road, and associated pipelines, as shown on the plats submitted in the Applications for Permits to Drill (APDs).

This decision does not authorize initiation of any surface disturbance on BLM-administered land or drilling and related activities of any Federal oil and gas wells. Such authorization will occur only upon approval by BLM of the APDs submitted by Williams Production RMT Company.

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: Approval of the Proposed Action validates existing rights granted with the Federal oil and gas leases to develop the leasehold to provide commercial commodities of oil and gas.

MITIGATION MEASURES: The environmental impacts would be mitigated (avoided or minimized) by the measures incorporated into the Proposed Action or attached as Conditions of Approval (COAs). These measures include 60-day Timing Limitations (TLs) prohibiting construction, drilling, and completion activities from January 1 to March 1 for the protection of use by big game of winter range and from March 1 to April 30 for the protection of an active raptor nest within 0.25 mile of the well pad.

NAME OF PREPARER: Rebecca Beavers, Natural Resource Specialist

SIGNATURE OF AUTHORIZED OFFICIAL:



Supervisory Natural Resource Specialist

DATE SIGNED: August 16, 2010



**APPENDIX A**

**Surface-Use and Downhole Conditions of Approval**

**Williams RMV 83-34 Well Pad**



**STANDARD SURFACE-USE CONDITIONS OF APPROVAL**  
**DOI-BLM-CO-N040-2010-0062-EA**

The following standard surface-use COAs are in addition to all stipulations attached to the respective Federal leases and to any site-specific COAs for individual well pads. These standard COAs shall be applied as appropriate based on specifics of the Proposed Action.

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

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

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

5. Jurisdictional Waters of the U.S. The operator shall obtain appropriate permits from the U.S. Army Corps of Engineers (USACE) prior to discharging fill material into waters of the U.S. in accordance with Section 404 of the Clean Water Act. Waters of the U.S. are defined in 33 CFR Section 328.3 and may include wetlands as well as perennial, intermittent, and ephemeral streams. Permanent impacts to waters of the U.S. may require mitigation. Contact the USACE Colorado West Regulatory Branch at 970-243-1199 ext. 17 (Travis Morse). Copies of any printed or emailed approved USACE permits or verification letters shall be forwarded to the BLM.

6. Wetlands and Riparian Zones. The operator shall restore temporarily disturbed wetlands or riparian areas. The operator shall consult with the BLM Colorado River Valley Field Office to determine appropriate mitigation, including verification of native plant species to be used in restoration.
7. Reclamation. The goals, objectives, timelines, measures, and monitoring methods for final reclamation of oil and gas disturbances are described in Appendix I (Surface Reclamation) of the 1998 Draft Supplemental EIS (DSEIS). Specific measures to follow during interim and temporary (pre-interim) reclamation are described below.
  - a. Reclamation Plans. In areas that have low reclamation potential or are especially challenging to restore, reclamation plans will be required prior to APD approval. The plan shall contain the following components: detailed reclamation plans, which include contours and indicate irregular rather than smooth contours as appropriate for visual and ecological benefit; timeline for drilling completion, interim reclamation earthwork, and seeding; soil test results and/or a soil profile description; amendments to be used; soil treatment techniques such as roughening, pocking, and terracing; erosion control techniques such as hydromulch, blankets/matting, and wattles; and visual mitigations if in a sensitive VRM area.
  - b. Deadline for Interim Reclamation Earthwork and Seeding. Interim reclamation to reduce a well pad to the maximum size needed for production, including earthwork and seeding of the interim reclaimed areas, shall be completed within 6 months following completion of the last well planned 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 number 19) shall be implemented for well pad construction or expansion where 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% by weight of other weed seeds. Seed may contain up to 2.0% 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% of the new plants are producing seed. The BLM will approve the type of fencing.
  - j. Monitoring. The operator shall conduct annual monitoring surveys of all sites categorized as “operator reclamation in progress” and shall submit an annual monitoring report of these sites to the BLM by **December 31** of each year. The monitoring program shall use the four Reclamation Categories defined in Appendix I of the 1998 DSEIS to assess progress toward reclamation objectives. The annual report shall document whether attainment of reclamation objectives appears likely. If one or more objectives appear unlikely to be achieved, the report shall identify appropriate corrective actions. Upon review and approval of the report by the BLM, the operator shall be responsible for implementing the corrective actions or other measures specified by the BLM.
8. Weed Control. The operator shall regularly monitor and promptly control noxious weeds or other undesirable plant species as set forth in the Glenwood Springs Field Office *Noxious and Invasive Weed Management Plan for Oil and Gas Operators*, dated March 2007. A Pesticide Use Proposal (PUP) must be approved by the BLM prior to the use of herbicides. Annual weed monitoring reports shall be submitted to BLM by **December 1**.
  9. Big Game Winter Range Timing Limitation. To minimize impacts to wintering big game, no construction, drilling or completion activities shall occur during a Timing Limitation (TL) period from **January 1 to March 1 annually**
  10. Bald and Golden Eagles. It shall be the responsibility of the operator to comply with the Bald and Golden Eagle Protection Act (Eagle Act) with respect to “take” of either eagle species. Under the Eagle Act, “take” includes to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest and disturb. “Disturb” means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, Feeding, or sheltering behavior; or (3) nest abandonment by substantially interfering with normal breeding, Feeding, or sheltering behavior. Avoidance of eagle nest sites, particularly during the nesting season, is the primary and preferred method to avoid a take. Any oil or gas construction, drilling, or completion activities planned within 0.5 mile of a bald or golden eagle nest, or other associated activities greater than 0.5 miles from a nest that may disturb eagles, should be coordinated with the BLM project lead and BLM wildlife biologist and the USFWS representative in the BLM Field Office (970-876-9051).
  11. Raptor Nesting. Raptor nest surveys in the project vicinity resulted in the location of one or more raptor nest structures within 0.25 mile of a well pad or 0.125 mile of an access road, pipeline, or other surface facility. To protect nesting raptors, a 60-day Timing Limitation (TL) shall be applied to construction, drilling, or completion activities within the buffer widths specified above, if the activities would be initiated during the nesting period of **March 1 to April 30**. An exception to this TL may be granted for any year in which a subsequent survey determines one of the following: (a) the nest is in a severely dilapidated condition or has been destroyed due to natural causes, (b) the nest is not occupied during the normal nesting period for that species, (c) the nest was occupied but subsequently failed due to natural causes, or (d) the nest was occupied but the nestlings have fledged and dispersed from the nest. In the case of a dilapidated nest or one that was destroyed due to natural causes, the TL shall apply to any alternate or replacement nest within the buffer widths specified above, unless an exception is granted for the alternate or replacement nest for one of the reasons listed.

12. 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 (Creed Clayton) and visit <http://www.fws.gov/mountain-prairie/contaminants/oilpits.htm>.
13. Birds of Conservation Concern. Pursuant to BLM Instruction Memorandum 2008-050, surface-disturbing activities on previously undisturbed surfaces are prohibited from **May 15 to July 15** 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.
14. Range Management. Range improvements (fences, gates, reservoirs, pipelines, etc) shall be avoided during development of natural gas resources to the maximum extent possible. If range improvements are damaged during exploration and development, the operator will be responsible for repairing or replacing the damaged range improvements. If a new or improved access road bisects an existing livestock fence, steel frame gate(s) or a cattleguard with associated bypass gate shall be installed across the roadway to control grazing livestock.
15. Ips Beetle. To avoid mortality of pinyon pines due to infestations of the *Ips* beetle, any pinyon trees damaged during road, pad, or pipeline construction shall be chipped after being severed from the stump or grubbed from the ground, buried in the toe of fill slopes (if feasible), or cut and removed from the site within 24 hours to a location approved by the Colorado State Forest Service.
16. Paleontological Resources. All persons associated with operations under this authorization shall be informed that any objects or sites of paleontological or scientific value, such as vertebrate or scientifically important invertebrate fossils, shall not be damaged, destroyed, removed, moved, or disturbed. If in connection with operations under this authorization any of the above resources are encountered the operator shall immediately suspend all activities in the immediate vicinity of the discovery that might further disturb such materials and notify the BLM of the findings. The discovery must be protected until notified to proceed by the BLM.

Where feasible, the operator shall suspend ground-disturbing activities at the discovery site and immediately notify the BLM of any finds. The BLM will, as soon as feasible, have a BLM-permitted paleontologist check out the find and record and collect it if warranted. If ground-disturbing activities

cannot be immediately suspended, the operator shall work around or set the discovery aside in a safe place to be accessed by the BLM-permitted paleontologist.

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

Pursuant to 43 CFR 10.4(g), the BLM shall be notified by telephone, with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4 (c) and (d), activities shall stop in the vicinity of the discovery, and the discovery shall be protected for 30 days or until notified by the BLM to proceed.

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

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

- whether the materials appear eligible for the National Register of Historic Places
- what mitigation measures the holder will likely have to undertake before the site can be used (assuming that *in-situ* preservation is not necessary)
- the timeframe for the BLM to complete an expedited review under 36 CFR 800.11, or any agreements in lieu thereof, to confirm through the SHPO State Historic Preservation Officer that the findings of the BLM are correct and that mitigation is appropriate

The operator may relocate activities to avoid the expense of mitigation and delays associated with this process, as long as the new area has been appropriately cleared of resources and the exposed materials are recorded and stabilized. Otherwise, the operator shall be responsible for mitigation costs. The BLM will provide technical and procedural guidelines for relocation and/or to conduct mitigation. Upon verification from the BLM that the required mitigation has been completed, the operator will be allowed to resume construction.

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

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

18. Visual Resources. Production facilities shall be placed as indicated on the plats attached to the APD, unless an alternative placement is approved by the BLM.

Above-ground facilities shall be painted a natural color selected to minimize contrast with adjacent vegetation or rock outcrops. The color shall be uniform among existing and new surface production facilities on the well pad.

19. Windrowing of Topsoil. Where appropriate, topsoil shall be windrowed around the pad perimeter to create a berm that limits and redirects stormwater runoff and extends the viability of the topsoil per BLM Topsoil Best Management Practices (BLM 2009 PowerPoint presentation available upon request from Glenwood Springs Field Office). Topsoil shall also be windrowed, segregated, and stored along pipelines and roads for later spreading across the disturbed corridor during final reclamation. Topsoil berms shall be promptly seeded to maintain soil microbial activity, reduce erosion, and minimize weed establishment. This COA does not apply to existing pads at which no new surface disturbance is proposed.

20. Reserve Pit. A minimum of 2 feet of freeboard shall be maintained in the reserve pit. Freeboard is measured from the highest level of drilling fluids and cuttings in the reserve pit to the lowest surface elevation of ground at the reserve pit perimeter.

21. Soils. Cuts and fills shall be minimized when working on erosive soils and slopes in excess of 30%. 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%, BLM personnel may request a professional geotechnical analysis prior to construction.

**DOWNHOLE CONDITIONS OF APPROVAL**  
**Applications for Permit to Drill**

**Company/Operator:** Williams Production RMT Company

**Surface Location:** SWSE, Section 34, Township 6 South, Range 94 West, 6<sup>th</sup> P.M.

<u>Well Name</u>	<u>Well No.</u>	<u>Bottomhole Location</u>	<u>Lease</u>
RWF	342-3	SENE Sec. 3, T. 7S, R. 94W.	COC07506
RWF	441-3	NENE Sec. 3, T. 7S, R. 94W.	COC07506
RWF	431-3	NWNE Sec. 3, T. 7S, R. 94W.	COC07506
RWF	341-3	NENE Sec. 3, T. 7S, R. 94W.	COC07506
RWF	432-3	SWNE Sec. 3, T. 7S, R. 94W.	COC07506
RWF	332-3	SWNE Sec 3, T. 7S, R. 94W.	COC07506
RWF	531-3	NWNE Sec. 3, T. 7S, R. 94W.	COC07506
RWF	31-3	NWNE Sec. 3, T. 7S, R. 94W.	COC07506
RWF	41-3	NENE Sec. 3, T. 7S, R. 94W.	COC07506
RWF	331-3	NWNE Sec. 3, T. 7S, R. 94W.	COC07506

1. Twenty-four hours prior to (a) spudding, (b) conducting BOPE tests, (c) 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: Steve Ficklin at 970-876-9036, David Giboo at 970-876-9038, or Todd Sieber at 970-876-9044.
2. A CRVFO petroleum engineer shall be contacted for a verbal approval prior to commencing remedial work, plugging operations on newly drilled boreholes, changes within the drilling plan, changes or variances to the BOPE, deviating from conditions of approval, and conducting other operations not specified within the APD. Contact Dane Geyer at 970-876-9048 (office) or 970-589-6887 (cell) for verbal approvals. A secondary contact is William Howell at 970-876-9049 (office) or 970-319-5837 (cell).
3. If a well control issue arises (e.g. kick, blowout, or water flow), casing failure occurs, or an increase in bradenhead pressure occurs during fracturing operations, Dane Geyer shall be notified within 24 hours from the time of the event.
4. The BOPE shall be tested and conform to Onshore Order #2 for a 3M system.
5. A casinghead rated to 3,000 psi or greater shall be utilized.
6. An electrical/mechanical mud monitoring equipment shall be functional prior to drilling out the next shoe. As a minimum, this shall include a pit volume totalizer, stroke counter, and flow sensor.
7. Gas detecting equipment shall be installed in the mud return system, prior to drilling out the next shoe, and hydrocarbon gas shall be monitored for pore pressure changes.

8. A gas buster shall be functional and all flare lines effectively anchored in place, prior to drilling out the next 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.
9. Prior to commencing fracturing operations, the production casing shall be tested to the maximum anticipated surface fracture pressure and held for 15 minutes. If leak-off is found, Dane Geyer 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.
10. On the first well drilled on this pad, a triple combo shall be run from TD to the surface casing shoe. This log shall be in accordance with 43 CFR 3162.4(b), which states that the operator shall submit a complete set of electrical/mechanical logs in .LAS format with standard Form 3160-4, Well Completion or Recompletion Report and LOG. Contact Todd Sieber at 970-876-9044 or [anthony\\_sieber@blm.gov](mailto:anthony_sieber@blm.gov) for clarification.

**11. Centralization program for specific surface strings:**

**RWF 441-3 & RWF 342-3: A turbolizer on each of the bottom three joints, one turbolizer every three joints to the build, two turbolizers per joint through the build, and one turbolizer at 80 feet.**

**API approved bow spring turbolizers shall be utilized. Turbolizers shall not ride free on the casing joints, rather, to prevent them from being pushed in the hole, turbolizers shall be installed over an API stop collar or casing collar, utilize integrated stop collars, or combination of the previously mentioned.**

**WOC 10 hours and run a SBL on both strings and submit them to the CRVFO 96 hours prior to commencing frac operations.**

12. As a minimum, cement shall be brought to 200 feet above the Mesaverde. Prior to commencing fracturing operations, a CBL shall be run (from TD to 200 feet above the TOC) and an electronic copy submitted to the CRVFO. 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 further instruction.
13. 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) Formation Integrity Test results with the well completion report. Contact Dane Geyer at 970-876-9048 for clarification.