

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

# ENVIRONMENTAL ASSESSMENT

## NUMBER

DOI-BLM-CO-N040-2011-0001-EA

## CASEFILE NUMBER

Federal Leases COC2799 and COC57943 (bottomholes)

## PROJECT NAME

Proposal to Drill Two Federal Wells from the Proposed RWF 43-23 Pad on Private Surface-Private Minerals on Taughenbaugh Mesa Area Southwest of Rifle, Garfield County, Colorado.

## PAD LOCATION

Township 6 South (T6S), Range 94 West (R94W), Section 23, NE $\frac{1}{4}$ SE $\frac{1}{4}$ , Sixth Principal Meridian. Pad elevation is 5,600 feet above mean sea level (MSL).

## APPLICANT

WPX Energy Rocky Mountain LLC. Contact: Greg Davis, 1515 Arapaho Street, Tower 3, Suite 1000, Denver, CO 80202.

## PROPOSED ACTION

WPX Energy Rocky Mountain LLC (“WPX”) proposes to drill and develop two new Federal oil and gas wells along with 13 fee wells from the proposed RWF 43-23 well pad located on private land (Mead) with underlying private minerals (“Fee” land). The Federal wells would be directionally drilled from the fee pad into nearby Federal leases COC2799 and COC57943 (Table 1). The project lies approximately four miles southwest of Rifle, Colorado near the northwestern edge of Taughenbaugh Mesa overlooking the Interstate 70, West Rifle interchange and the Colorado River (Figure 1). The pad would be located in a dryland horse pasture with the new 0.4 mile access road traversing across an irrigated field north of Garfield County Road 320 (CR 320). All components of the Proposed Action would be on private lands.

<b>Table 1. Surface and Bottomhole Locations of Proposed Federal Wells</b>		
<i>Proposed Wells</i>	<i>Surface Locations (Section 23, T6S, R94W)</i>	<i>Bottomhole Locations (Section 23, T6S, R94W)</i>
Mead RWF 32-23	NE $\frac{1}{4}$ SE $\frac{1}{4}$ , 2302 feet FSL 256 feet FEL	Lot 3, 1660 feet FNL 1877 feet FEL
Mead RWF 42-23	NE $\frac{1}{4}$ SE $\frac{1}{4}$ , 2293 feet FSL 226 feet FEL	Lot 9, 1349 feet FNL 911 feet FEL

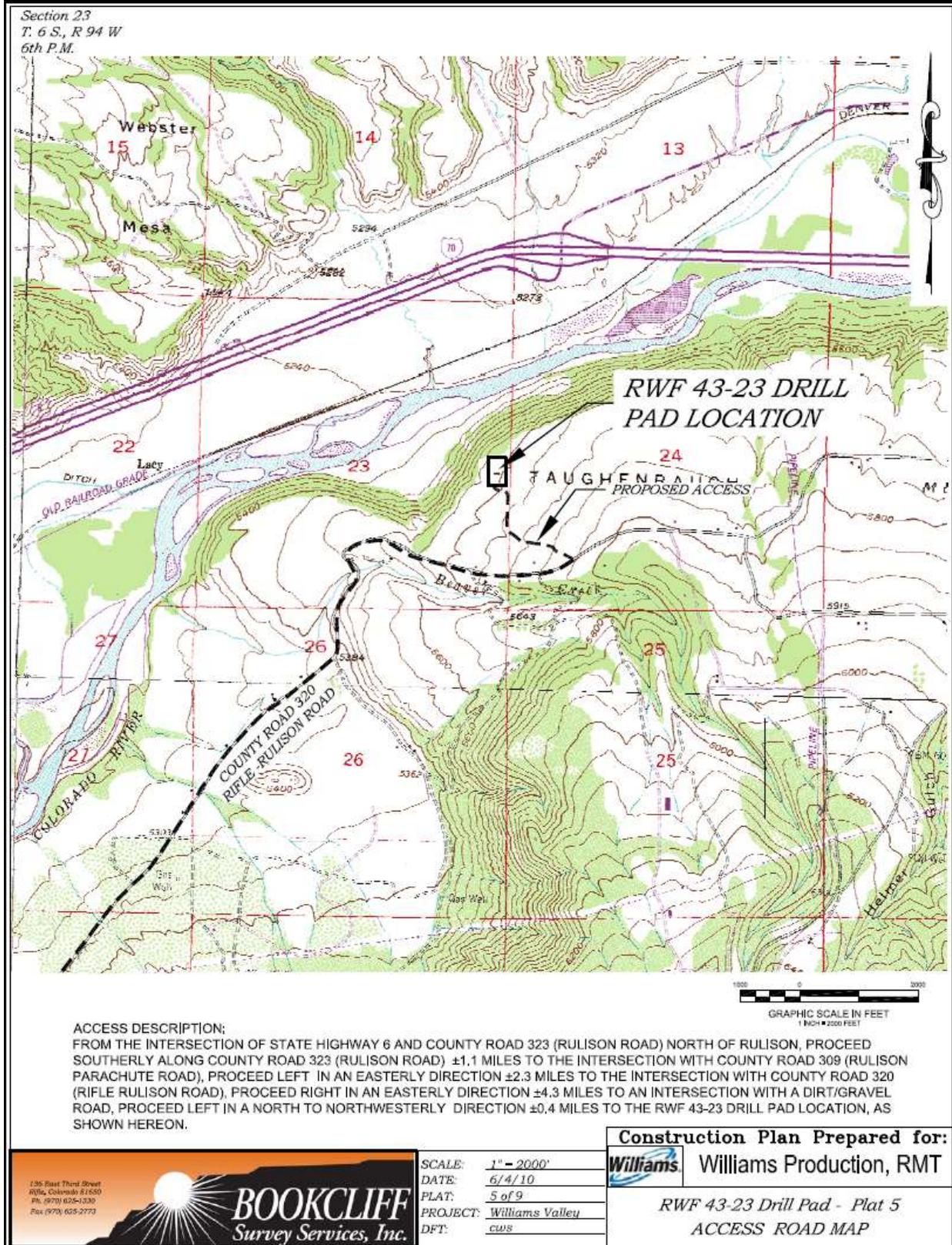


Figure 1. Location Map Featuring Proposed Pad and Access Road.

Two residences are located south of the proposed pad with the closest home lying less than 500 feet from the drill site. The operator has obtained surface use agreements from the private landowner for the pad and access road. The proposed buried natural gas and water pipelines serving this pad would cross land of the owner of the nearest residence (Figure 2). The new pipelines would have a different alignment than the proposed access road. A year after submissions of the Applications for Permit to Drill (APDs), a surface use agreement for the pipelines was obtained in fall 2011 by WPX. A cultural resource inventory was conducted of the proposed pipeline route in October 2011 yielding no reportable findings; the finalized pipeline alignment was the final element needed to move ahead with APD permitting.

The new pad access road (2,100 feet in length) would begin near the existing RWF 14-24 pad north of CR 320 (Figure 2). No public access is available to the project site as it lies entirely on private land. During road pioneering, topsoil would be stripped and windrowed along the upper and lower sides of the road disturbance corridor to provide enhanced reclamation opportunities. Final culvert locations and sizes would be determined during the preconstruction inspection and, if necessary, further refined after the road has been pioneered. Existing irrigation ditches would be crossed with the new route requiring culvert installations. Approximately 10 to 20 juniper trees would be removed with chainsaws to accommodate the road construction work. The access road would be built with a 22-foot running surface and an additional 4 feet for ditch. The road grade would average far less than 10% as the alignment traverses an irrigated field. The entire road would be surfaced with at least a 6-inch depth of gravel.

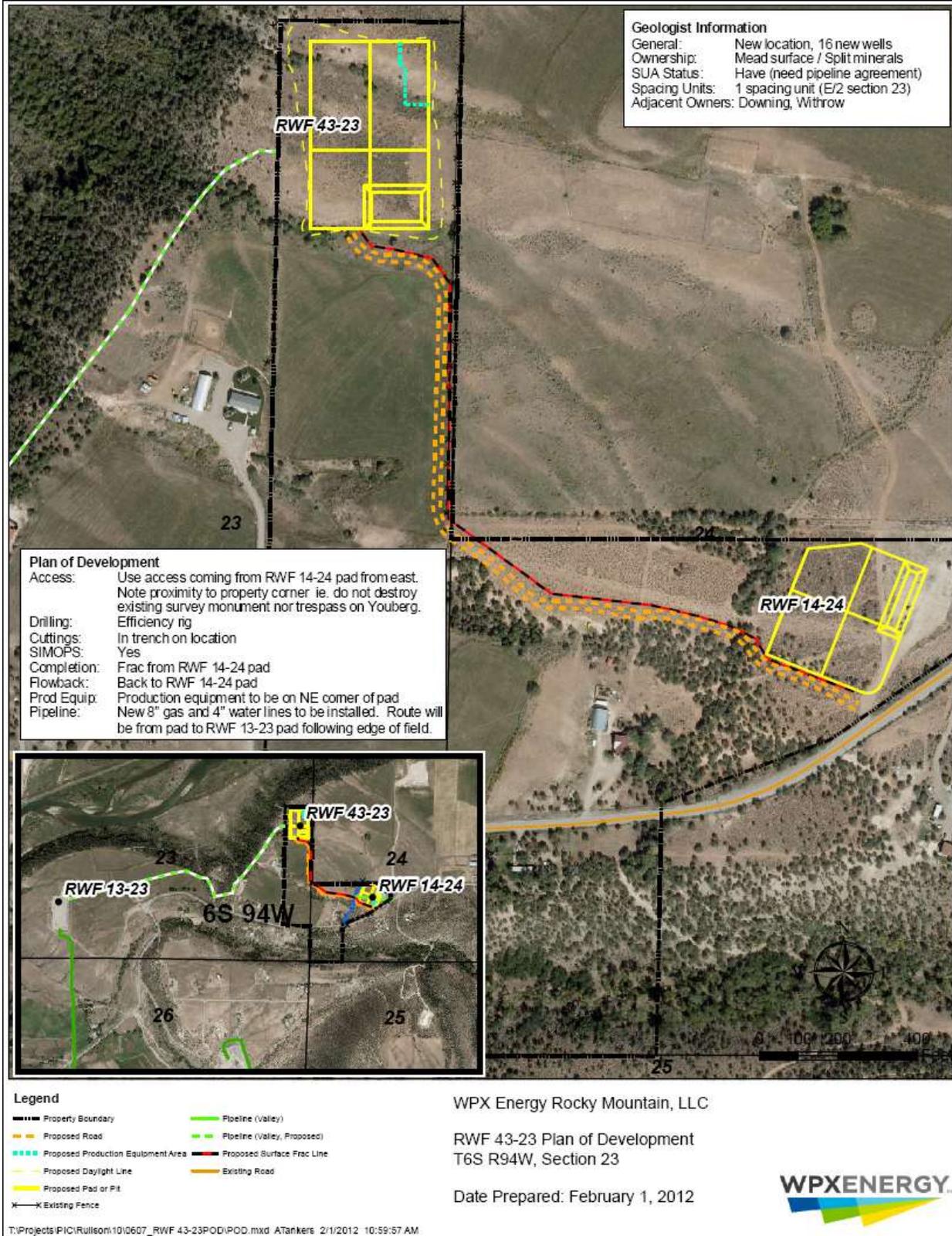
The proposed 475-foot by 300-foot pad would have a disturbance footprint of 6.3 acres with a maximum cut of 18.4 feet at the southeast corner and a maximum fill of 22.6 feet at the northwest pad corner (Figure 3). The access road would create 1.7 acres of new disturbance based on an average width of 35 feet. The eight-inch steel gas pipeline and four-inch poly produced water line would be buried between the existing RWF 13-23 pad the proposed RWF 43-23 pad (Figure 2). The pipeline alignment would generally follow the boundary of the irrigated fields at the edge of Taughenbaugh Mesa. The total length of the pipeline would be 5,270 feet; the pipeline disturbance corridor would be 50 feet. Pipeline disturbance would amount to 6.0 acres.

For completion work on the planned wells, as many as four five-inch diameter temporary steel surface lines would be installed alongside the new access road between the existing RWF 14-24 pad and the proposed RWF 43-23 pad (Figure 2). The RWF 14-24 pad would be used in its existing condition for remote frac operations.

Total short-term project surface disturbance related to the new pad (6.3 acres), road (1.7 acres) and pipelines (6.0 acres) would amount to 14.0 acres occurring on Mead and neighboring properties. Interim reclamation would reduce the pad to 2.5 acres of long-term disturbance (1.3 acres for the working area of the pad and 1.2 acres for the access road). No public land would be affected by the planned developments.

Topsoil would be stripped during the initial earthwork and windrowed around the pad perimeter. The pad would be designed to limit any excess material from pad construction. Cuttings generated from the numerous planned well bores would be placed in a trench that would be developed across the pad's southeast corner against the cutslope. Diversion ditches would be constructed to direct surface flow around the pad perimeter.

The road, pipeline, and pad construction work would follow the guidelines established in the BLM Gold Book, *Surface Operating Standards for Oil and Gas Exploration and Development* (USDI and USDA 2007). A road maintenance program is required during production of the wells would, but not be limited to, blading, ditching, culvert installation and cleanout, weed control, and gravel surfacing where excessive rutting or erosion may occur. Roads would be maintained in a safe and usable condition.



**Figure 2. Proposed Project Plan of Development on Private Land.**

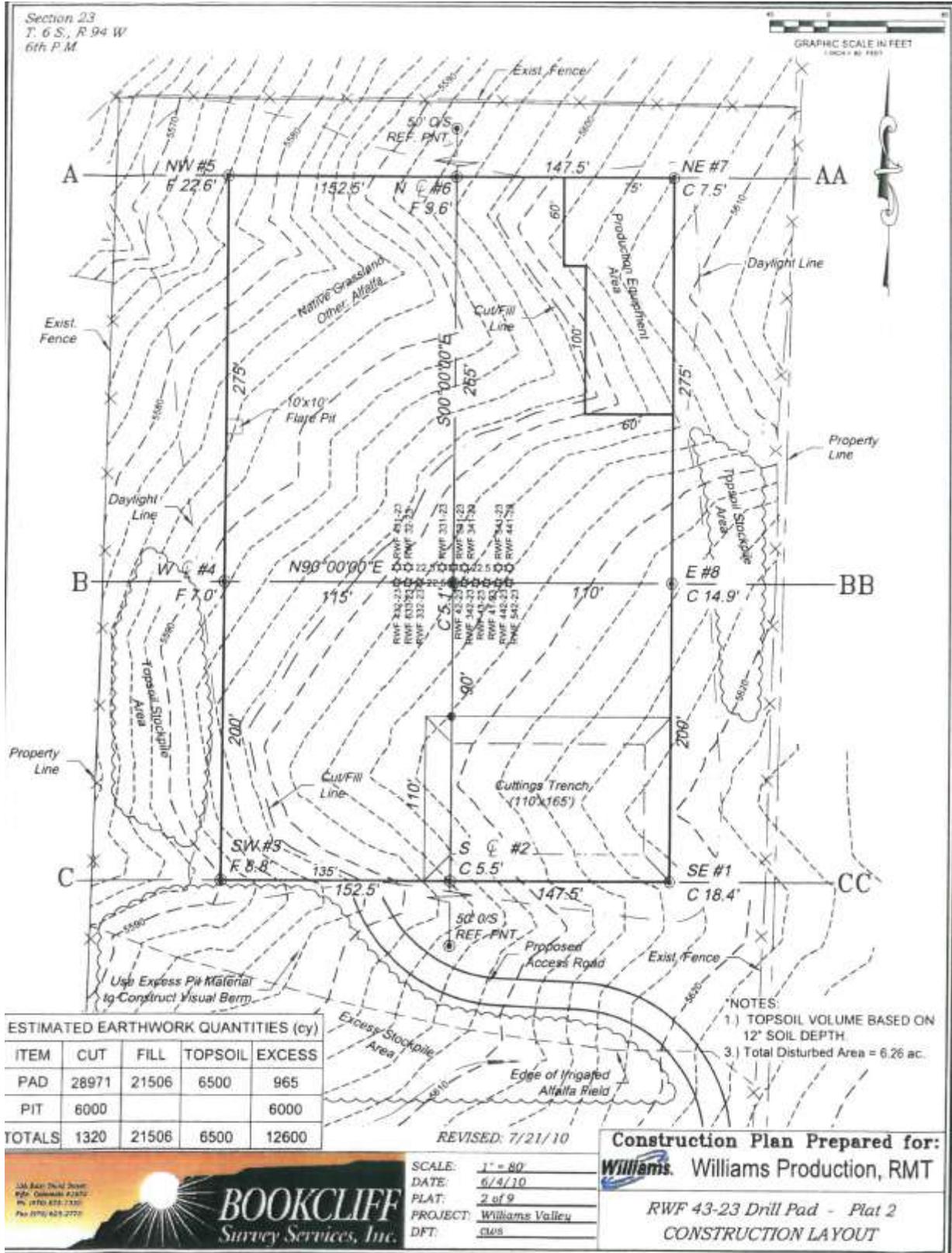


Figure 3. RWF 43-23 Pad Construction Layout.

The Proposed Action would include well drilling and well completion, production of natural gas and associated liquid condensate, proper handling and disposal of produced water, and interim and final reclamation.

The Proposed Action would be implemented consistent with Federal oil and gas lease, Federal regulations (43 CFR 3100), and the operational measures included in the Applications for Permit to Drill (APDs). Appendix A lists the specific Surface Use Conditions of Approval that would be implemented as mitigation measures for this project. The operator would be responsible for continuous inspection and maintenance of the access roads, pads and pipelines.

### **NO ACTION ALTERNATIVE**

The Proposed Action involves Federal subsurface minerals encumbered with Federal oil and gas leases that grant the lessee a right to explore and develop the leases. Although BLM cannot deny the right to drill and develop the leasehold, individual APDs can be denied to prevent unnecessary and undue degradation.

Since all of the planned development would occur on private surface with underlying fee minerals, including the drilling and completion of the other 13 fee wells, the No Action Alternative would comprise the project components described in the Proposed Action except for the drilling and completion of the two Federal wells. For analysis purposes, the surface disturbance on private lands would remain the same (14.0 acres) for the No Action Alternative.

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

The purpose of the Proposed Action is to develop oil and gas resources on Federal leases COC2799 and COC57943 consistent with existing Federal lease rights. The action is needed to increase the development of oil and gas resources for commercial marketing to the public.

### **SUMMARY OF LEASE STIPULATIONS**

The two Federal wells would be directionally drilled from the proposed RWF 43-23 pad located on Fee land with private surface owned by Mr. and Mrs. Mead. Because the Federal wells would have bottomholes in Federal mineral leases not underlying the Mead property, protective surface-use stipulations attached to those leases do not apply applicable to the construction, drilling, completion, or well production operations at the RWF 43-23 pad or on private land. However, surface-use Conditions of Approval (COAs) would be attached to the Federal well APDs for the protection of Federal resources (see Appendix A).

### **PLAN CONFORMANCE REVIEW**

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

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

Decision Language: The 1991 Oil and Gas Plan Amendment (BLM 1991) included the following at page 3: “697,720 acres of BLM-administered mineral estate within the Glenwood Springs Resource Area are

open to oil and gas leasing and development, subject to lease terms and (as applicable) lease stipulations” (BLM 1991, page 3). This decision was carried forward unchanged in the 1999 ROD and RMP amendment at page 15 (BLM 1999b): “In areas being actively developed, the operator must submit a Geographic Area Proposal (GAP) [currently referred to as a Master Development Plan, MDP] that describes a minimum of 2 to 3 years of activity for operator controlled leases within a reasonable geographic area.”

**Discussion:** The Proposed Action is in conformance with the 1991 and 1999 RMP amendments cited above because the Federal mineral estate proposed for development is open to oil and gas leasing and development. The 1999 RMP amendment requires multi-year development plans known at that time as Geographic Area Plans (GAPs) for lease development over a large geographic area. However, the 1999 RMP amendment also provides exceptions to that requirement for individual or small groups of exploratory wells drilled in relatively undrilled areas outside known high production areas. The Proposed Action, as such, is in conformance with the exception to the requirement to require operators to submit Master Development Plans (MDPs), previously known as Geographic Area Plans (GAPs).

### **STANDARDS FOR PUBLIC LAND HEALTH**

In January 1997, Colorado BLM approved the Standards for Public Land Health. The five standards cover upland soils, riparian systems, plant and animal communities, threatened and endangered species, and water quality. Standards describe conditions needed to sustain public land health and relate to all uses of the public lands.

Environmental analysis of proposed projects on BLM land must address whether the Proposed Action or alternatives being analyzed would result in impacts that would maintain, improve, or deteriorate land health conditions identified in the applicable Land Health Assessment (LHA). However, because no component of the Proposed Action would involve BLM surface lands, an LHA does not apply, and conformance with the land health standards is not evaluated in this EA.

### **AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

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

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

#### **Access and Transportation**

##### **Affected Environment**

The project area is accessed from the BLM office in Silt, Colorado by exiting Interstate 70 exit #90 at Rifle then traveling southwest on the Rulison-Rifle Road (CR 320) and west past Beaver Creek Road (CR 317) for about 4 miles until it intersects with the RWF 14-24 pad located on the north side of CR320.

All oil and gas development traffic serving the project would be originate from Interstate 70, Rulison exit #81. Garfield County has a designated truck haul route east of the Rulison exit which would involve traveling 1.1 miles along CR323 (Rulison Road) to the CR 309 intersection, then traveling 6.6 miles east along CR 320 to the intersection with the RWF 14-24 access road. The vehicle use and safety, load permitting and road maintenance on this haul route is the responsibility of Garfield County Road and Bridge Department. No public access is available to the project site as it lies wholly on private lands.

### Environmental Consequences

#### *Proposed Action*

Constructing 0.4 mile of new 22-foot-wide access road with a 35-foot-wide disturbance corridor would create 1.7 acres of new surface disturbance. After reclamation of the road cuts and fills, the long-term disturbance for the new road would total 1.2 acres. All disturbances would occur on private land. The Proposed Action would result in a substantial increase in truck traffic related to the development of the 15 wells. The largest increase would be during rig-up, drilling, and completion activities. Data indicate that approximately 1,160 truck trips over a 30-day period would be required to support the drilling and completion of each well (Table 2). Once the wells are producing, traffic would decrease to occasional visits for monitoring or maintenance activities. Each well may have to be recompleted once per year, requiring three to five truck trips per day for approximately 7 days.

<b>Table 2. Traffic Associated with Drilling and Completion Activities</b>		
<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 to ensure adequate dust abatement and road maintenance would be attached as COAs to APDs for the Federal wells (Appendix A).

#### *No Action Alternative*

Dropping the two Federal wells from consideration in this alternative would represent a reduction of potentially 13% of the number of vehicles supporting the drilling and completion work. There would be no change from the transportation impacts identified in the Proposed Action as they relate to construction of the pad, road or pipelines or the 30-year projected time period of the producing wells.

### 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>), sulfur dioxide (SO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter less than 10 microns (μ) in diameter (PM<sub>10</sub>), and particulate matter less than 2.5 μ in diameter (PM<sub>2.5</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. Regional background values are well below established standards, and all areas within the cumulative study area are designated as attainment for all criteria pollutants. Federal air quality regulations are enforced by the CDPHE. The Prevention of Significant Deterioration (PSD) program within CDPHE is designed to limit incremental increases for specific air pollutant concentrations above a legally defined baseline level, as defined by an area's air quality classification. Incremental increases in PSD Class I areas are strictly limited.

Federal air quality regulations adopted and enforced by CDPHE limit incremental emissions increases to specific levels defined by the classification of air quality in an area. The PSD Program is designed to limit the incremental increase of specific air pollutant concentrations above a legally defined baseline level. Incremental increases in PSD Class I areas are strictly limited, while increases allowed in Class II areas are less strict.

The project area and surrounding areas are classified as PSD Class II, as is Dinosaur National Monument, located approximately 80 miles to the northwest. 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 Park (approximately 65 miles south), and Eagles Nest Wilderness (approximately 60 miles east).

### Environmental Consequences

#### *Proposed Action*

The CDPHE, under delegated authority from the US Environmental Protection Agency (EPA) and in conformance with Colorado's State Implementation Plan (SIP), is the agency with primary responsibility for air quality regulation and enforcement in conjunction with industrial developments and other air pollution sources in Colorado. Unlike the conceptual "reasonable but conservative" engineering designs used in NEPA analyses, any CDPHE air quality preconstruction permitting is based on site-specific, detailed engineering values, which are assessed in CDPHE's review of the permit application.

The RWF 43-23 pad includes constructing, drilling, completing, and operating up to 2 new Federal wells and 13 fee wells in one planned visit. Although the impacts to air quality from these wells are disclosed in this EA, the drilling and operation is permitted with the approval of an APD for each well. Individual wells would require approximately 7 to 10 days to drill and approximately 5 to 15 days to complete. Horizontal wells would require approximately 15 to 30 days to drill and 10 to 45 days to complete. Air quality would decrease during construction of access roads, pads, and pipelines and drilling and completing the wells.

Pollutants generated during construction activities would include combustion emissions and fugitive dust associated (PM<sub>10</sub> and PM<sub>2.5</sub>) with construction equipment and vehicles. Construction activities for the well pad, access road, and pipelines would occur between the hours of 7:00 a.m. and 6:00 p.m. each day. Once construction activities are complete, air quality impacts associated with these activities would also cease.

Fugitive dust from mobilization and rigging up the drill rig would also occur however impacts associated would be minor and short lived. Emissions associated with drilling and completing the wells would also be greatly reduced to emissions associated with long term natural gas and condensate production.

A regional air model addressing air quality impacts of current and future oil and gas activities within the CRVFO has recently been completed for the BLM by Tetra Tech, Inc. and its subcontractor, URS Corporation. The methods and results of that modeling are presented in an Air Resources Technical Support Document (ARTSD) (BLM 2011). The air quality model addressed impacts associated with emissions of greenhouse gases (GHGs), “criteria pollutants” (CO, NO<sub>2</sub>, SO<sub>2</sub>, ozone, PM<sub>10</sub>, and PM<sub>2.5</sub>), hazardous air pollutants (HAPs) including BTEX (benzene, ethylbenzene, toluene, and xylenes), formaldehyde, and n-hexane.

The modeling also addressed potential impacts on visibility due to particulates and “photochemical smog” (caused by chemical reactions in the atmosphere) and on lake chemistry of selected pristine lakes due to modeled deposition rates of sulfur and resultant impacts on acid neutralizing capacity of the lake waters. The visibility analysis predicted a slight impact (one day per year with a reduction in visibility of 1 deciview or greater) in the Flat Tops Wilderness and no days with 1 deciview or greater reduction in visibility at all other modeled Class I and II receptors. For the remaining pollutants analyzed, modeled levels of future oil and gas development within the CRVFO would have no or negligible long-term adverse impacts on air quality. Since the Proposed Action is within the scope of the future development modeled, no significant adverse impacts on air quality are anticipated.

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

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

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

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

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

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

#### *No Action Alternative*

The No Action Alternative constitutes denial of the two Federal APDs described in the Proposed Action. However, the remaining project components described in the Proposed Action would be implemented as those actions would directly serve the planned fee wells slated for the RWF 43-23 pad. The 14.0 acres of surface disturbance on private land would still occur under the No Action Alternative. Therefore, impacts of the No Action Alternative on air quality would be less than under the Proposed Action but not eliminated.

#### **Cultural Resources**

Two Class III cultural resource inventories (intensive pedestrian inventories identified as CRVFO# 1111-15 and 1112-7) have been conducted for the proposed RWF 43-23 well pad access road and pipeline, located on private land with underlying private minerals. The Federal wells would be directionally drilled from the fee pad into nearby Federal leases. No “Historic properties” were identified during this inventory. “Historic properties” are cultural resources that are eligible or potentially eligible for inclusion on the National Register of Historic Properties (NRHP).

#### **Environmental Consequences**

##### *Proposed Action*

Implementation of the Proposed Action would have no direct impacts to known “historic properties” as none were discovered during cultural inventories. Therefore, the BLM made a determination of “**No Historic Properties Affected.**” This determination was made in accordance with the 2001 revised regulations [36CFR 800.4(d)(1)] for Section 106 of the National Historic Preservation Act (16U.S.C 470f), the BLM/State Historic Preservation Officer (SHPO) Programmatic Agreement (1997) and Colorado Protocol (1998)]. Therefore, no formal consultation was initiated with the SHPO.

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

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

*No Action Alternative*

The No Action Alternative constitutes denial of the two Federal APDs described in the Proposed Action. However, the remaining project components described in the Proposed Action would be implemented as those actions would directly serve the planned fee wells slated for the RWF 43-23 pad. The 14.0 acres of surface disturbance on private land would still occur under the No Action Alternative.

**Geology and Minerals**

**Affected Environment**

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

Bedrock exposure within the proposed project area is the Tertiary Wasatch Formation. The Wasatch Formation, is described as interbedded, variegated reddish-brown, tan and white conglomerate, conglomeratic sandstone, siltstone, mudstone, and claystone unconformably overlying Mesaverde rocks (Shroba et al 1995). The Mesaverde Group is composed of mudstones and sandstones with interlayered coal beds and ranges in thickness from about 3,000 to over 7,000 feet. The Mesaverde Group has also been referred to as the Mesaverde Formation, which includes informal subdivisions based on gas productivity characteristics. Table 3 lists the surficial geologic formations present in the project area.

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

<b>Table 3. Geologic Formations within the Study Area</b>				
<i>Map Symbol</i>	<i>Formation Name</i>	<i>Age</i>	<i>Characteristics</i>	<i>Location</i>
Qfp	Flood Plain Deposits	Holocene	Silty, very fine to medium sand.	Flood plains and river channels.
Qtt	Oldest terrace alluvium	Pleistocene	Stream alluvium	Low terraces and stream channels
Qdi	Intermediate Debris Flow	Pleistocene	Debris flow and stream alluvium	Fans and low terraces
Qlo	Loess	Pleistocene	Wind deposited clayey, sandy silt.	Gently sloping surficial deposits.
Tw	Wasatch formation	Eocene	See above	Bedrock exposures

Source: Shroba et al. 1995

The proposed drilling program would target the sandstone sequences of the Upper Williams Fork Formation, which provide most of the natural gas production volumes (Lorenz 1989). Upper portions of the Williams Fork include fluvial point bar, floodplain, and swamp deposits. The Lower Williams Fork includes delta front, distributary channel, strandplain, lacustrine, and swamp environments (Hemborg 2000), while the sandstones and coalbeds of the Iles Formation were deposited in a wave-dominated coastal setting (Johnson 1989, Lorenz 1989). The source rocks are interbedded and thermally mature gas-prone shales, mudstones, siltstones, and coals. The reservoir rocks are the fine to medium-grained Williams Fork sandstones, varying in thickness from less than 10 feet to more than 50 feet (Spencer 1988), creating an interbedded relationship between source and reservoir. The trapping mechanism of the gas is both stratigraphic, related to vertical and lateral changes in the types of sediments being deposited, and diagenetic (post-depositional), related to changes in chemical and physical changes in the rocks during prolonged burial at great depth.

### Environmental Consequences

#### *Proposed Action*

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

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

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

#### *No Action Alternative*

The No Action Alternative constitutes denial of the two Federal APDs described in the Proposed Action. However, the 13 fee wells described in the Proposed Action would be drilled, completed, and produced on the RWF 43-23 pad.

## **Invasive Non-Native Plants**

### **Affected Environment**

State-listed noxious weeds present in the project area include a light to moderate scattering of cheatgrass (*Anisantha tectorum*), an aggressive non-native annual grass that is problematic throughout the region. Other state-listed weeds observed include three non-native biennial forbs—houndstongue (*Cynoglossum officinale*), common mullein (*Verbascum thapsus*), and musk thistle (*Carduus acanthoides*)—all present along the edge of the juniper woodland in the western extent of the project area. Another state-listed noxious weed, field bindweed (*Convolvulus arvensis*), a trailing perennial forb, was evident in the irrigated fields southeast of the pad and in proximity to the proposed access road. Invasive non-native annual forbs within the project area that are not listed as noxious weeds in Colorado but nonetheless problematic in terms of overall habitat quality and potentially affecting reclamation success included tall tumble-mustard (*Sisymbrium altissimum*), common goosefoot (*Chenopodium album*), and Russian-thistle (*Salsola* sp.). (WWE 2010).

### **Environmental Consequences**

#### *Proposed Action*

Surface-disturbing activities provide a niche for the invasion and establishment of invasive, non-native species particularly when these species are already present in the surrounding area. Because invasive, non-native species are present in the project area, the potential for increased establishment of these undesirable plants following construction activities is high. Consequently, the standard weed control COA would be attached to APDs to require periodic monitoring and weed control practices to ensure that these weedy plants are controlled (see Appendix A).

#### *No Action Alternative*

The No Action Alternative constitutes denial of the two Federal APDs described in the Proposed Action. However, the 13 fee wells described in the Proposed Action would be drilled, completed, and produced on the RWF 43-23 pad. Consequently, surface disturbance and the potential for invasion or spread of noxious weeds would be similar under both alternatives.

## **Migratory Birds**

### **Affected Environment**

Habitat of the project area varies depending on slope, aspect, hydrology, elevation, and soils. Vegetation at the pad site is primarily basin big sagebrush (*Artemisia tridentata tridentata*) with an understory of crested wheatgrass (*Agropyron cristatum*), a widely planted non-native dryland pasture grass. The area southeast of the pad consists of irrigated hay meadows of alfalfa and brome grass with a few scattered junipers in dry rocky areas. North-facing slopes between the mesa and the river have vegetation that varies depending on the moisture regime of the specific site. Utah juniper (*Sabina osteosperma*), rubber rabbitbrush (*Chrysothamnus nauseosus*), shadscale (*Atriplex confertifolia*), greasewood (*Sarcobatus vermiculatus*), and basin big sagebrush occur on dry, rocky areas. Seeps and drainages fed by irrigation water from the mesa are inherently more mesic and are vegetated with narrowleaf and plains cottonwoods (*Populus angustifolia*, *P. deltoides*), skunkbrush sumac (*Rhus trilobata*), coyote willow (*Salix exigua*), broadleaf cattail (*Typha latifolia*), and western virgins-bower (*Clematis ligusticifolia*) (WWE 2010).

Species on the BCC list that may be present in pinyon-juniper woodlands in the area include the pinyon jay (*Gymnorhinus cyanocephalus*) and juniper titmouse (*Baeolophus griseus*). A juniper titmouse was seen during a survey completed in 2010 (WWE 2010). Other species associated with this habitat type include Neotropical migrants such as the broad-tailed hummingbird (*Selasphorus platycercus*), black-chinned hummingbird (*Archilochus alexandri*), 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 (*Spinus psaltria*).

Sagebrush habitats may support one BCC species, Brewer's sparrow (*Spizella breweri*), as well as the vesper sparrow (*Poocetes gramineus*) and lark sparrow. Based on the extent and quality of the sagebrush, the habitat is marginal for Brewer's sparrow and probably unsuitable for another sagebrush obligate, the sage sparrow (*Amphispiza bellii*).

A raptor survey was completed in September 2010. A total of five raptor nests were detected during the survey. The status of these nests could not be determined since the survey was conducted outside of the nesting season. Surveys conducted during the breeding season allow for an increased detection rate of occupied/active nests as well as determination of species present. Of the five nests observed, one was located in a box elder tree and the remaining four nests were found in cottonwood trees. In addition to the nests, during the survey of the hillside south of the proposed pad, a Cooper's hawk (*Accipiter cooperii*) was observed in the area on two occasions, as was one red-tailed hawk (*Buteo jamaicensis*) and one great horned owl (*Bubo virginiana*) (WWE 2010). A new raptor survey would be required prior to construction, drilling, or completion activities as the survey that was completed in 2010 has since expired.

### Environmental Consequences

#### *Proposed Action*

The Proposed Action would result in minor loss of nesting, roosting, perching, and foraging habitat for migratory birds on disturbed areas and reduce habitat effectiveness adjacent to areas where disturbance-related effects could be expected. This change to amount and contiguity of habitat could negatively affect individuals or nesting pairs of bird species that require large expanses of intact habitat. Habitat fragmentation could result in increased competition, increased exposure to predators, and a higher likelihood of nest parasitism. It is also possible that individual nests could be destroyed if well pads, roads, and production facilities were constructed during the nesting season.

In addition to the physical loss of habitat and habitat fragmentation, it is possible that, individual birds could be displaced to adjacent habitats due to noise and human presence during construction activities. Effects of displacement could include increased risk of predation or failure to reproduce if adjacent habitat is at carrying capacity. Furthermore, impacts to birds at the species or local population level could include a change in abundance and composition as a result of cumulative habitat fragmentation from energy development in the larger area. Impacts to migratory bird species that nest in pinyon-juniper and sagebrush habitats can be minimized by avoiding surface-disturbing activities during the nesting season. take place outside the nesting season.

All native bird species except for certain state-managed gamebirds are protected by the Migratory Bird Treaty Act (MBTA), which makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any migratory bird, including the feathers or other parts, nests, eggs, or migratory bird products. In addition to the MBTA, Executive Order 13186 sets forth the responsibilities of Federal agencies to further implement the provisions of the MBTA by integrating bird conservation principles and practices into agency activities and by ensuring that Federal actions evaluate the effects of actions and agency plans

on migratory birds. Consistent with Executive Order 13186 and BLM Colorado guidelines, CRVFO has established a COA (Appendix A) prohibiting initiation of vegetation removal in areas providing suitable nesting habitat for BCC species during the period May 15 to July 15, which is the peak period for incubation and brood rearing among migratory birds. An exception to this COA may be granted if surveys by a qualified biologist during the nesting season of BCC species potentially present indicates no active nests within 30 meters (100 feet) of the disturbance area.

An additional COA for the protection of migratory birds requires that any pits containing fluids are fitted with one or more devices to avoid or minimize exposure to the fluids by migratory birds from acute toxicity or compromised insulation or buoyancy due to loss of natural oils on the feathers (Appendix A).

#### *No Action Alternative*

Under the No Action Alternative, impacts to Migratory Birds would be slightly less than under the Proposed Action due to two fewer wells as a result of denial of the Federal APDs. Although the area of direct and indirect disturbance would not differ, the total duration of intensive human activities would be reduced by several days or a few weeks.

### **Native American Religious Concerns**

#### Affected Environment

The proposed RWF 43-23 well pad project area is located within a larger area identified by the Ute Tribes as part of their ancestral homeland. Cultural resource inventories (see section on Cultural Resources) were conducted to determine if there were any areas that might be culturally sensitive to Native Americans. No sensitive areas were identified during the inventories and none are currently known in the proposed project area.

#### Environmental Consequences

##### *Proposed Action*

At present, no Native American concerns are known within the project area and none were identified during the inventories. The Ute Tribe of the Uintah and Ouray Bands, the primary Native American tribe in this area of the CRVFO, have indicated that they do not wish to be consulted for small projects or projects where no Native American areas of concern have been identified either through survey or past consultations. Therefore, formal consultation was not undertaken. If new data are disclosed, new terms and conditions may have to be negotiated to accommodate their concerns.

Although the Proposed Action would have no direct impacts, increased access and personnel in the vicinity of the proposed project could indirectly impact unknown Native American resources ranging from illegal collection to vandalism.

The National Historic Preservation Act (NHPA) requires that if newly discovered cultural resources are identified during project implementation, work in that area must stop and the agency Authorized Officer notified immediately (36 CFR 800.13). The Native American Graves Protection and Repatriation Act (NAGPRA), requires that if inadvertent discovery of Native American Remains or Objects occurs, activity must cease in the area of discovery, a reasonable effort made to protect the item(s) discovered, and immediate notice made to the agency Authorized Officer, as well as the appropriate Native American group(s) (IV.C.2). Notice may be followed by a 30-day delay (NAGPRA Section 3(d)). Further actions also require compliance under the provisions of NHPA and the Archaeological Resource Protection Act.

WPX would notify its staff and contractors of the requirement under the NHPA, that work must cease if cultural resources are found during project operations. A standard Education/Discovery COA for the protection of Native American values would be attached to the APDs (Appendix A). The importance of these COAs would be stressed to the operator and its contractors, including informing them of their responsibilities to protect and report any cultural resources encountered. The proponent and contractors would also be made aware of the requirements under the NAGPRA.

#### *No Action Alternative*

The No Action Alternative constitutes denial of the two Federal APDs described in the Proposed Action. However, the remaining project components described in the Proposed Action would be implemented in conjunction with the 13 fee wells slated for the RWF 43-23 pad. The 14.0 acres of surface disturbance on private land would still occur under the No Action Alternative.

### **Noise**

#### Affected Environment

The Proposed Action would lie within a rural setting approximately 0.5 mile south of Interstate 70 overlooking the West Rifle interchange. The closest residence would be less than 0.25 mile south of the proposed pad. Noise levels in the project area are presently created by traffic serving the existing nearby well pads on Taughenbaugh Mesa.

Noise is generally described as unwanted sound, weighted and noise intensity (or loudness) is measured as sound pressure in 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 the sounds that need to be measured. Each 20-unit increase in the decibel scale increases the sound loudness by a factor of 10. Sound levels 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). 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 construction, drilling, and completion phases. The noise would be most noticeable along the roads used to haul equipment and at the pad location. Drilling activities are subject to noise abatement procedures as defined in the 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 2006 revised COGCC noise control rules call for noise levels from oil and gas operations at any well site and/or gas facility to comply with the maximum permissible levels (Table 4) at a distance of 350 feet.

<b>Table 4. Noise Standards for Light industrial, Residential/Agriculture/Rural</b>		
<i>Zone</i>	<i>7:00 A.M. to 7:00 P.M</i>	<i>7:00 P.M. to 7:00 A.M</i>
Light Industrial	70 dBA	65 dBA
Residential/Agricultural/Rural	55 dBA	50 dBA

Given the remote locations of the proposed project activities, with no reasonably close occupied structure or designated recreational area, the light industrial standard is applicable. The allowable noise level for periodic impulsive or shrill noises is reduced by 5 dBA from the levels shown (COGCC 2008).

Short-term (7- to 14-day) increases in nearby noise levels would characterize road and well pad construction while the existing cuttings pit is reopened. Based on the Inverse Square Law of Noise Propagation (Harris 1991) and an typical noise level for construction sites of 65 dBA at 500 feet (Table 5), project-related noise levels would be approximately 59 dBA at a distance of 1,000 feet, approximating active commercial areas (EPA 1974).

<b>Table 5. Noise Levels at Typical Construction Sites and along Access Roads</b>			
<i>Equipment</i>	<i>Noise Level (dBA)</i>		
	<i>50 feet</i>	<i>500 feet</i>	<i>1,000 feet</i>
Air Compressor, Concrete Pump	82	62	56
Backhoe	85	65	59
Bulldozer	89	69	63
Crane	88	68	62
Front End Loader	83	83	57
Heavy Truck	88	68	62
Motor Grader	85	65	59
Road Scraper	87	67	61
Tractor, Vibrator/Roller	80	60	54
Sources: BLM (1999a), La Plata County (2002)			

Traffic noise 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 5 approximately 68 dBA of noise (at 500 feet) would be created by each fuel and water truck that travels these roads. Less noise would be created by smaller trucks and passenger vehicles such as pickup trucks and sport utility vehicles. Although the duration of increased noise from this source would be short, it would occur repeatedly during the drilling and completion phases.

Noise impacts would decrease during the production phase but would remain background noise levels. During maintenance and well workover operations, noise levels would temporarily increase above those associated with routine well production.

These increased noise levels would be in addition to levels of noise that are already above background levels due to current oil and gas developments in the area. As stated above, the nearest residence is less than 0.25 mile away. While exposure to these noise levels is not likely to be harmful, it is likely to be annoying to residents.

*No Action Alternative*

Dropping the two Federal wells under this alternative would not reduce noise levels associated with construction, drilling, and completion activities or during long-term production over the typical 30-year life of the wells because 13 of the total 15 wells (the fee wells) would still be developed. However, the overall duration of elevated noise levels during drilling and completion activities would be reduced because less total time would be required without the two Federal wells.

## **Socioeconomics**

### **Affected Environment**

The project area is located within Garfield County, Colorado. The total county land area is 2,947 square miles (DOLA 2012). The county seat is Glenwood Springs; other towns include Carbondale, New Castle, Silt, Rifle, Parachute, and Battlement Mesa. Interstate 70 transects the county from east to west. A network of county and private roads services the project area.

Since 20000, the population of Garfield County increased 28.8 percent from 44,259 to 56,389 residents (DOLA 2012). Population growth in Garfield County is expected to more than double over the ensuing 20 years to 119,979 in 2030 (DOLA 2012). Currently the population density is 19.1 people per square mile, which is low compared to the U.S. average. The county population in July 2009 was approximately 70 percent urban and 30 percent rural (USDOC 2012).

Unemployment was 10.7 percent in April 2010, slightly more than the State of Colorado, 9.2 percent. The total number of workers employed in oil and gas development is difficult to define since development-related occupations appear in a variety of economic sectors. However, oil and gas drilling and production have been one of the strongest forces driving recent economic growth. Other economic activities that occur in the project area include hay production and livestock grazing.

In 2009, Garfield County had an estimated 32,692 jobs. Industry groups with the highest percentage of total employment were construction (15%), tourism (14%), retail trade (13%), and education and health (8%) (Table 6).

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

Personal income in Garfield County has also risen, growing approximately 6 percent per year from \$1.3 billion in 2000 to \$2.1 billion in 2009. Annual per capita income has grown in the same period approximately 3 percent per year, from \$29,080 to \$37,099 (USDOC 2012). The total number of housing units in Garfield County is 23,309 and the homeownership rate is 67.2 percent. The per capita income in 2009 dollars was \$28,038. The communities of Parachute, Silt, and Rifle are considered to have the most affordable housing, while the communities of Battlement Mesa, New Castle, and Glenwood Springs are considered to have the least affordable housing, where the cost to rent or own similar housing may be 50% or more higher (BLM 2006).

Activities on public land in the vicinity of the project area are primarily ranching/farming, hunting, OHV travel, and the development of oil and gas resources. Hunters contribute to the economy because many require lodging, restaurants, sporting goods, guides and outfitting services, food, fuel, and other

associated supplies. Big-game hunting, in particular, is viewed as critical to Garfield County, and especially the local community economies that depend on BLM and Forest Service public lands where most hunting occurs (BLM 2006). Expenditures by hunters in the Roan Plateau Planning Area alone have been estimated to be as much as \$1 million annually, with perhaps an additional \$1 million annually of indirect and local expenditures (CPW 1995, cited in BLM 2006).

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

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

The Federal government makes Payments in Lieu of Taxes (PILT) to County governments to help offset property tax revenue lost on non-taxable Federal lands located within County boundaries (BLM 2006). The PILT distributions are based on acres for all Federal land management agencies (e.g., approximately 1.9 million acres in Garfield County). The amount may also be adjusted based on population and as apportioned by Congress. By formula, payments are decreased as other Federal funds, such as mineral royalty payments, increase. PILT amounts to Garfield County in the last 5 years are shown in Table 7 (USDI NBC 2011).

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

In addition to PILT distributions, BLM shares revenue generated by commercial activities on public lands with State and County governments (BLM 2006). Federal mineral royalties (FMLs) are collected on oil and gas production from Federal mineral leases. Oil and gas lessees pay royalties equal to 12.5% of the wellhead value of oil and gas produced from public lands. Half of the royalty receipts are distributed to Colorado. In 2008 and 2009, Garfield County received FML and Severance Direct Distribution Payments

totaling \$2,744,802 and \$11,400,046 respectively (AGNC 2011). These funds are then allocated to fund County services, schools, and local communities.

NEPA 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.” In 2010, 28.3% of the residents of Garfield County identified themselves as Hispanic or Latino, and this is slightly higher than for Colorado (20.7%). African Americans, American Indians, and Pacific Islanders account for less than 2% of the Garfield County population, which are below state levels (DOLA 2010).

### Environmental Consequences

#### *Proposed Action*

The Proposed Action would have minor positive impacts on the local economy of Garfield County through the creation of additional job opportunities in the oil and gas industry and in supporting trades and services. In addition, Garfield County would receive additional tax and royalty revenues. The Proposed Action could result in negative social impacts including changing the recreational character of the area, reducing scenic quality, increasing dust levels during construction, and increasing traffic.

#### *No Action Alternative:*

Because this alternative would include construction and drilling/completion/production of 13 of the total of 15 wells planned for the pad, socioeconomic impacts would be comparable. However, although negative impacts associated with an additional oil and gas facility would be basically identical or slightly greater due to slightly greater traffic, these would be offset by positive impacts associated with the Federal royalties generated under the Proposed Action.

### Soils

#### Affected Environment

According to the *Soil Survey of Rifle Area, Colorado* (USDA 1985), the proposed activities would be located primarily on two soil complexes, with a very short section of the pipeline on a second soil type. The well pad access road and pipeline would be constructed on the Potts loam complex. This deep, well-drained soil is found on mesas, alluvial fans, and sides of valleys at elevations from 5,000 to 7,000 feet and slopes of 3 to 6 percent. This soil is derived from sandstone, shale, or basalt. Surface runoff is slow, and erosion hazard is moderate. Primary uses for these soils are dryland farming and irrigated crops.

A short section of the proposed pipeline, as it connects to the RWF13-23, would be located on the Potts Loam complex. This deep, well-drained soil is found on mesas, benches, and sides of valleys at elevations from 5,000 to 7,000 feet on moderately sloping to rolling hills. This soil is derived from sandstone, shale, or basalt. Surface runoff is medium and erosion hazard is severe. Primary uses for these soils are grazing, wildlife habitat and dryland farming.

### Environmental Consequences

The Proposed Action would result in approximately 14.0 acres of short-term vegetation loss and soil disturbance, with a long-term loss of approximately 2.5 acres. The area generally contains adequate vegetation buffers that would minimize the potential for sediment transport. However, construction activities would cause slight increases in local soil loss, loss of soil productivity, and sediment available

for transport to surface waters. Potential for such soil loss and transport would increase as a function of slope, feature (pad, road, or pipeline route) to be constructed, and proximity to drainages.

The proposed pad, access road and pipeline would be located on soils with moderate risk of erosion or slope instability. Particular care should be taken during construction and reclamation to ensure that proper BMPs, including the COAs listed in Appendix A, are utilized to prevent erosion and slope instability due to construction activities.

#### *No Action Alternative*

The No Action Alternative constitutes denial of the two Federal APDs described in the Proposed Action. However, the remaining project components described in the Proposed Action would be implemented as those actions would directly serve the planned fee wells slated for the RWF 43-23 pad. The 14.0 acres of short-term surface disturbance and 2.5 acres of long term disturbance on private land would still occur under the No Action Alternative.

### **Special Status Species**

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

##### Affected Environment

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

##### Environmental Consequences

#### *Proposed Action*

The results of a plant survey conducted in October 2010 indicate no Federally listed, proposed, or candidate plant species or suitable habitat for these species in the project area (WWE 2010). Therefore, the project would have “**No Effect**” on these species.

#### *No Action Alternative*

Because there is no potential habitat for any Federally listed, proposed, or candidate plant species in the project area, there would be no impacts to these species from the No Action Alternative.

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

##### Affected Environment

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

Canada Lynx (*Lynx canadensis*). Federally listed as threatened. Canada lynx occupy high-latitude or high-elevation coniferous forests characterized by cold, snowy winters and an adequate prey base (Ruggiero et al. 1999). The preferred prey of Canada lynx throughout their range is the snowshoe hare (*Lepus americanus*). In the western United States, lynx are associated with mesic forests of lodgepole

pine, subalpine fir, Engelmann spruce, and quaking aspen in the upper montane and subalpine zones, generally between 8,000 and 12,000 feet in elevation. Although snowshoe hares are the preferred prey in Colorado, lynx in also feed on other species such as the mountain cottontail (*Sylvilagus nuttallii*), pine squirrel (*Tamiasciurus hudsonicus*), and dusky grouse (*Dendragapus obscurus*).

The U.S. Forest Service (USFS) has mapped suitable denning, winter, and other habitat for lynx within the White River National Forest (WRNF), portions of which are adjacent to BLM lands within the CRVFO. The mapped suitable habitat in the WRNF comprises several areas known as Lynx Analysis Units (LAUs). Several LAUs border BLM lands along the Interstate 70 corridor from east of Wolcott to west of DeBeque. While BLM lands within the CRVFO area are generally not suitable habitat, they may support movement by animals dispersing to a new area or, potentially, moving to lower elevations during severe winter weather in search of prey. The project area does not border the Battlement Creek LAU, and this species is therefore not considered further in this document.

Mexican Spotted Owl (*Strix occidentalis*). Federally listed as threatened. In Colorado, the Mexican spotted owl occurs in lower elevation forests, mostly in deeply incised, rocky canyons that contain complex coniferous forest structures. The project area does not contain suitable habitat and this species is therefore not considered further in this document.

Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*). Candidate for Federal listing. This secretive species occurs in mature riparian forests of cottonwoods and other large deciduous trees with a well-developed understory of tall riparian shrubs. Habitat along Beaver Creek appears too limited in extent and quality for use by the cuckoo. Although a more extensive riparian community occurs along the Colorado River a few miles south of the project area, historic grazing use, and recent industrial use of the corridor have resulted in conditions seemingly unsuitable for this species. For these reasons, the western yellow-billed cuckoo is species is not considered further.

Razorback Sucker (*Xyrauchen texanus*), Colorado Pikeminnow (*Ptychocheilus lucius*), Humpback Chub (*Gila cypha*), and Bonytail Chub (*G. elegans*). Federally listed as endangered. These four species of Federally listed big-river fishes occur within the Colorado River drainage basin near or downstream from the project area. Designated Critical Habitat for the razorback sucker and Colorado pikeminnow includes the Colorado River and its 100-year floodplain west (downstream) from the town of Rifle. The nearest known habitat for the humpback chub and bonytail is within the Colorado River approximately 80 miles downstream from the project area. Occasionally, the bonytail is in Colorado west of Grand Junction, but its range does not extend east from that point. Only one population of humpback chub, at Black Rocks west of Grand Junction, is known to exist in Colorado.

Greenback Cutthroat Trout (*Oncorhynchus clarki stomias*). Federally listed as threatened. The greenback cutthroat trout was not identified on the USFWS list for Garfield County. However, recent surveys have identified a population in a small stream that enters the Colorado River from the south approximately 4 miles west (downstream) from the project area. This species was not found during electrofishing surveys in West Fork Parachute Creek and is not considered potentially present.

## Environmental Consequences

### *Proposed Action*

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

The endangered Colorado River fishes could potentially be affected by the consumptive use of water taken from the Colorado River basin to support activities associated with the Proposed Action. Depletions in flows in the Colorado River and major tributaries are a major source of impacts to these fishes due to changes in the flow regime that reduce the availability and suitability of spawning sites and habitats needed for survival and growth of the larvae. Principal sources of depletion in the Colorado River basin include withdrawals for agricultural or industrial uses, withdrawals for municipal water supplies, and evaporative losses from reservoirs. On average, approximately 0.7 acre-feet of Colorado River water is consumed during activities related to each oil and gas well.

In 2008, the 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 this PBA, the USFWS issued a Programmatic Biological Opinion (PBO) (ES/GJ-6-CO-08-F-0006) on December 19, 2008. The PBO concurred with BLM's effects determination of "**May Affect, Likely to Adversely Affect**" the Colorado pikeminnow, humpback chub, bonytail 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. The estimated depletions from the Proposed Action would be added to the CRVFO tracking log and submitted to the USFWS per the PBA/PBO at the end of the year to account for depletions associated with BLM's fluid mineral program. The calculated mitigation fees are used by the USFWS for mitigation projects and contribute to the recovery of these endangered species through restoration of habitat, propagation, and genetics management, instream flow identification and protection, program management, non-native fish management, research and monitoring, and public education.

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

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

#### *No Action Alternative*

Under the No Action Alternative, impacts to Federally Listed, Proposed, or Candidate Animal Species would be slightly less due to the denial of the two Federal APDs. However, disturbance acres would not change and human disturbance would be only slightly reduced due to the drilling of the 13 fee wells.

***BLM Sensitive Plant Species***

Affected Environment

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

Environmental Consequences

*Proposed Action*

The results of a plant survey conducted in October 2010 indicate no BLM sensitive plant species or suitable habitat for these species in the project area (WWE 2010). Therefore, the project would have “**No Effect**” on these species.

*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 8. Species indicated in the table as present or possibly present in the project vicinity are described more fully following the table.

<b>Table 8. Special Status Vertebrate Species Present or Potentially Present in the Project Area</b>		
<i>Common Name</i>	<i>Habitat</i>	<i>Potential for Occurrence</i>
Fringed myotis, Townsend’s big-eared bat	Breed and roost in caves, trees, mines, and buildings; hunt over pinyon-juniper, montane conifers, and semi-desert shrubs.	Possible
Northern goshawk	Predominantly uses montane and subalpine coniferous forests and aspen forests but may move to lower elevation pinyon/juniper woodland in search of prey during winter.	Possible in winter
Bald eagle	Nests and roosts in mature cottonwood forests along rivers, large streams, and lakes.	Nests and roosts along Colorado River
Peregrine falcon	Nests on cliffs, usually near a river, large lake, or ocean. Hunts for waterfowl on water or upland fowl across grasslands and steppe.	Nests on Roan Cliffs
Brewer’s sparrow	Nests in large stands of sagebrush, primarily Wyoming sagebrush on level or undulating terrain.	Possible
Midget faded rattlesnake	Cold desert dominated by sagebrush and with an abundance of rock outcrops and exposed canyon walls, typically farther west than the project area.	Possible
Great Basin spadefoot	Habitat includes pinyon-juniper woodlands and semi-desert shrublands, typically farther west than the project area.	No suitable habitat

<b>Table 8. Special Status Vertebrate Species Present or Potentially Present in the Project Area</b>		
<i>Common Name</i>	<i>Habitat</i>	<i>Potential for Occurrence</i>
Northern leopard frog	Wet meadows and the shallows of marshes, ponds, lakes, streams, and irrigation ditches.	Possible
Flannelmouth sucker and roundtail chub	Restricted to rivers and major tributaries.	Present in Colorado River
Bluehead sucker	Found in smaller streams with a rock substrate and mid to fast flowing waters.	Not present
Colorado River cutthroat trout	Headwaters streams and ponds with cool, clear waters and no non-native cutthroat subspecies	Present in Beaver Creek

## Environmental Consequences

### *Proposed Action*

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

Northern Goshawk (*Accipiter gentilis*) – This species is mostly limited to spruce/fir or aspen forests, such as atop the Roan Plateau, Battlement Mesa, and other areas that reach subalpine elevations. However, goshawks may migrate to lower elevation pinyon/juniper or Douglas-fir habitats during winter and therefore could make occasional, transitory use of the project area for winter foraging. Goshawks feed primarily on small birds but also on diurnal small mammals (rabbits, chipmunks, etc.).

Bald Eagle (*Haliaeetus leucocephalus*) – Formerly listed as endangered, then downlisted to threatened and subsequently removed from the list of threatened or endangered species, the bald eagle remains protected by the Bald and Golden Eagle Protection Act (BGEPA) as well as the MBTA. Bald eagles nest and roost along the Colorado and most likely occasionally venture into the Parachute Creek drainage for hunting activities. Bald eagles hunt primarily for fish and waterfowl but secondarily for rabbits, ground squirrels, or other upland prey, especially in winter. Any use of the West Fork Parachute Creek canyon by this species would be expected to be infrequent and transitory.

Peregrine Falcon (*Falco peregrinus*) – Also formerly listed as endangered, then downlisted to threatened and subsequently removed from the list of threatened or endangered species, the peregrine falcon nests along the Roan Cliffs in the general project vicinity and hunts primarily for waterfowl along the Colorado River or upland fowl and other birds on nearby sagebrush-covered plateaus. No peregrine nests are known near the project area, and Beaver Creek is not suitable hunting habitat due to its small sizes and dense tree cover. Peregrines may hunt for birds on the sagebrush slopes of the canyon sides.

Brewer's Sparrow (*Spizella breweri*) – This species is a near-obligate on sagebrush and is common in expansive stands, especially those dominated by Wyoming big sagebrush on level to rolling or undulating terrain. Smaller stands or those on steep mountainsides may also be used, and the species occasionally nests in stands of short willows near timberline. The sagebrush habitat on the sideslopes of the project area is marginally suitable for nesting by this Neotropical migrant.

Midget Faded Rattlesnake (*Crotalus viridis concolor*) - This species is mostly limited to areas with rock outcrops that provide escape cover, thermal cover, and especially hibernacula. These are crucial components for reproduction and survival and are uncommon in the project vicinity. Though the midget faded rattlesnake is known to occur in northwestern Colorado in a variety of habitats, including pinyon and juniper woodlands and shrublands, it is not expected to occur within the project area.

Northern Leopard Frog (*Rana pipiens*) – The northern leopard frog is limited to perennial waters, including ponds and slow-flowing perennial streams or persistent portions of intermittent streams. It requires good water quality and abundant aquatic or shoreline vegetation. The habitat along West Fork Parachute Creek appears marginally suitable for the species, but no leopard frogs have been reported during fish surveys or other surveys of the stream. Because the project would not involve habitat disturbance near water sources, impacts to this species are not expected.

Flannelmouth Sucker (*Catostomus latipinnis*), Bluehead Sucker (*C. discobolus*), and Roundtail Chub (*Gila robusta*) – As with the endangered Colorado River fishes described previously, these species are vulnerable to alterations in flow regimes in the Colorado River that affect the availability and suitability of spawning sites and habitats needed for development of the larvae. The amount of consumptive water use associated with the Proposed Action would not be expected to cause discernible impacts to flows in the Colorado River.

Also similarly to the endangered big-river fishes, these species are adapted to naturally high sediment loads and therefore would not be affected by increased sediment transport to the Colorado River. However, they are vulnerable to inflow of sediments into smaller streams, smothering the eggs. The potential for adverse impacts from inflow of chemical pollutants is also greater in small streams due less dilution and the presence of larval or juvenile fishes, which are more susceptible to mortality from acute toxicity. COAs for the protection of water quality (Appendix A) would minimize the potential for impacts from inflow of sediments or toxicants. Prompt implementation of the SPCC plan following any spill or other release of hydrocarbons, saline waters, or other contaminants would further reduce the risk of significant adverse impacts to these species and other aquatic life in affected waters.

Colorado River Cutthroat Trout (*Oncorhynchus clarki pleuriticus*) – Populations of this subspecies of cutthroat trout occur mostly in headwater streams and lakes of the Colorado River drainage. This includes Beaver Creek, which passes within approximately 75 yards from the proposed pad and extends parallel to the proposed pipeline route. The most recent sampling by CPW fisheries personnel confirmed the occurrence of Colorado River cutthroat trout in Beaver Creek. The reach of stream that was sampled also found to support non-native brown trout (*Salmo trutta*) in greater abundance than the Colorado River cutthroat trout. The highly piscivorous brown trout may be a threat to populations of the native trout. Potential adverse impacts from inflow of chemical pollutants is greater in small streams such as Beaver Creek due to less dilution and the presence of larval or juvenile fishes, which are more susceptible to mortality from acute toxicity. COAs for the protection of water quality (Appendix A) would minimize the potential for impacts from inflow of sediments or toxicants. Prompt implementation of the operator's required Spill Prevention, Control, and Countermeasures (SPCC) plan following any spill or other release of hydrocarbons, saline waters, or other contaminants would further reduce the risk of significant adverse impacts to this species and other aquatic life in affected waters.

#### *No Action Alternative*

Under the No Action Alternative, impacts to BLM Sensitive Species would be slightly less due to the two Federal APDs that would be denied. However, disturbance acres would not change and human disturbance would be only slightly reduced due to the drilling of the 13 fee wells.

## **Vegetation**

### Affected Environment

The project area consists of sagebrush shrubland with a minor amount of Utah juniper, as well as cultivated fields of alfalfa (*Medicago sativa*) field. The sagebrush shrubland was previously seeded with crested wheatgrass, currently the dominant herbaceous species in the area. Other species in this habitat type include a native subshrub (broom snakeweed, *Gutierrezia sarothrae*), a small cactus (brittle pricklypear (*Opuntia fragilis*), and an invasive non-native annual grass (cheatgrass; see the section on Invasive Non-Native Species).

The cultivated alfalfa field is bordered by basin big sagebrush with mixed with crested wheatgrass, a native subshrub (winterfat, *Krascheninnikovia lanata*), a native perennial forb (copper mallow, (*Sphaeralcea coccinea*), and cheatgrass.

### Environmental Consequences

#### *Proposed Action*

Under the Proposed Action, 14.0 acres of new disturbance would occur on private land. This disturbance would be reduced to 2.5 acres following successful interim reclamation. With implementation of standard COAs (Appendix A), desirable forbs and grasses on the unused portions of the pad, road, and pipeline could be established within 2 to 3 years. However, because of the potential for additional well bores in the future, it is likely that vegetation would consist primarily of seeded perennial grasses with only a minor component of colonizing native forbs for the life of the wells.

#### *No Action Alternative*

The No Action Alternative would result in the same acres of disturbance as the Proposed Action so impacts on vegetation would be similar.

## **Visual Resources**

### Affected Environment

The Proposed Action would occur on private land on the Taughenbaugh Mesa south of I-70, the West Rifle Interchange, and the Colorado River. The existing landscape consists of gently rolling hills that slope to the north and are incised by minor drainages that run from the southeast to the northwest. There is minimal elevation change overall. Vegetation is predominantly gray-green sagebrush flats with scattered dark green Utah Juniper trees surrounded by irrigated agricultural fields. Vegetation becomes slightly more diverse and dense within the drainages creating continuous horizontal lines in the landscape. Pockets of tan exposed soil are common throughout the proposed project location. There are existing structures nearby including private residences, ranch houses and associated outbuildings, and the Mead residence located less than ¼ mile to the south from the proposed RWF 43-23 pad. The structures consist of geometric lines, blocky forms, smooth texture, and a variety of colors (white, gray, brown, and green).

The project area is located within the foreground/middle ground of I-70 and CR 320. The visual exposure from I-70 would be limited to eastbound traffic between Parachute and Rifle due to the proximity and the topographic nature of Taughenbaugh Mesa. The proposed project location would be located near the edge of the mesa. The casual observer's inferior line of sight would be interrupted by the topography created by the edge of the mesa. Casual observers traveling along CR 320 would have a somewhat

superior angle of view to proposed project location but there is existing vegetation and topography that would disrupt the line of sight. In addition, the speed in which the casual observer would be traveling along both travel corridors would also limit the duration the project location would be in view. The Proposed Action would be most visible to private landowners living adjacent to the site.

Since the RWF 43-23 pad would be located on private land, Federal lease terms regarding visual concerns are not applicable. Visual resource management (VRM) objectives do not apply to non-BLM lands; visual values for those lands are only protected by landowner discretion. Although VRM objectives do not apply to non-BLM lands, visual concerns may be addressed on split estate where Federal minerals occur.

### Environmental Consequences

#### *Proposed Action*

Construction of the Proposed Action would create visual contrast within the immediate landscape by removing the existing vegetation, exposing bare ground, and creating a series of distinct lines and colors within the landscape. Such visual changes would be most evident during construction and completion activities. Once wells are put into production, the pad recontoured, and vegetation reestablished, the overall visual contrast and texture of the site would be expected to blend with the surroundings. Short-term visual impacts include light pollution, dust, and increased traffic from construction, drilling, and completion activities. Such impacts should be adequately mitigated by proper utilization of the standard and site-specific COAs.

The total short-term disturbance related to the Proposed Action would amount to 14.0 acres with the long-term disturbance after site reclamation and successful revegetation amounting to 2.5 acres.

#### *No Action Alternative*

Under the No Action Alternative, APDs for the two Federal wells would be denied. However, this would not affect development of the 13 fee wells. The existing visual environment would still be impacted, and surface disturbance would remain the same (14.0 acres).

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

#### Affected Environment

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

BLM Instruction Memoranda numbers WO-93-344 and CO-97-023 require that all National Environmental Policy Act documents list and describe any hazardous and/or extremely hazardous materials that would be produced, used, stored, transported, or disposed of as a result of a proposed project. The Glenwood Springs Resource Area, Oil & Gas Leasing & Development, Draft Supplemental Environmental Impact Statement (June 1998), Appendix L, Hazardous Substance Management Plan, contains a comprehensive list of materials that are commonly used for oil and gas projects. It also includes a description of the common industry practices for use of these materials and disposal of the waste products. These practices are dictated by various Federal and State laws and regulations, and the

BLM standard lease terms and stipulations that would accompany any authorization resulting from this analysis. The most pertinent of the Federal laws dealing with hazardous materials 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.
- The Resource Conservation and Recovery Act (RCRA) (Public Law 94-580, October 21, 1976) regulates the use of hazardous substances and disposal of hazardous wastes. Note: While oil and gas lessees are exempt from RCRA, right-of-way holders are not. RCRA strictly regulates the management and disposal of hazardous wastes.

Emergency response to hazardous materials or petroleum products on BLM lands are handled through the BLM Grand Junction Field Office contingency plan. BLM would have access to regional resources if justified by the nature of an incident.

### Environmental Consequences

#### *Proposed Action*

Possible pollutants that could be released during the construction phase of this project would include diesel fuel, hydraulic fluid, and lubricants. These materials would be used during construction of the pads, roads, and pipelines, and for refueling and maintaining equipment and vehicles. Potentially harmful substances used in the construction and operation phases would be kept onsite in limited quantities and trucked to and from the site as required. No hazardous substance, as defined by 40 CFR 355 would be used, produced, stored, transported, or disposed of in amounts above threshold quantities.

Waste generated by construction activities would not be exempt from hazardous waste regulations under the oil and gas exploration and production exemption of RCRA. Exempt wastes would include those associated with well production and transmission of natural gas through the gathering lines and the natural gas itself.

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

Solid waste (human waste, garbage, etc.) would be generated during construction activities and, to a larger extent, during drilling and completion operations since a man camp would be created on the southern edge of the pad. While providing food and lodging for the workers, support services such as bear-proof trash storage, potable and sewer water storage, generator and transformer settings, a fuel storage area and a freezer for food storage would be provided to complete the plans for the man camp. Potable water (one 4,200 gallon water supply tank and three 3,300 gallon water supply tanks) and septic service (seven 2,000 gallon above-ground septic tanks with overflow tanks and alarms) would be provided every 2-3 days by certified water and septic providers licensed by the State (Appendix A).

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

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

#### *No Action Alternative*

The No Action Alternative would consist of denial of the APDs for the two Federal wells. However, development of the 13 fee wells under the authority of the COGCC would have the same potential for impacts as described above for the Proposed Action, with only a slight different in risk level.

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

#### *Surface Water*

##### Affected Environment

The project area is within the Colorado River watershed below Beaver Creek watershed. The ephemeral streams in the vicinity of the project flow southerly and drain directly into the Colorado River, approximately 0.5 mile northwest of the RWF 43-23 pad.

At this time, no water quality data are available for the ephemeral drainages near the RWF 43-23 pad site. These drainages are not currently on the State of Colorado's *Stream Classifications and Water Quality Standards* (CDPHE, WQCC Regulation No. 37) (CDPHE 2007), the State of Colorado's *303(d) List of Water Quality Limited Segments Requiring TMDLS* (CDPHE, WQCC Regulation No. 93) (CDPHE 2006a), or the State of Colorado's *Monitoring and Evaluation List* (CDPHE, WQCC Regulation No. 94) (CDPHE 2006b).

Sediment is a pollutant of concern for the Colorado River Basin (CDPHE, WQCC Regulation No. 94). The closest downstream sediment measuring station on the Colorado River is USGS station 9093700 near De Beque, Colorado. For the period of 1974 to 1976 the mean sediment yield was 1,818 tons per day and varied between 8 and 41,300 tons per day. The median value for the same period was 267 tons/day. (USGS 2007).

## Environmental Consequences

### *Proposed Action*

Potential impacts to surface water associated with the Proposed Action include increased erosion and sedimentation of streams, changes in channel morphology due to road and pipeline crossings, and contamination by drilling fluids, produced water, or condensate. Surface waters would be most susceptible to sedimentation during construction, drilling, and completion activities, which would collectively last approximately 150 days. After this period, reclamation activities would substantially reduce surface exposure, decreasing the risk to surface waters over the long term.

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

Other elements of the Proposed Action are designed to mitigate risks to surface waters associated with the release of drilling fluids, produced water, and condensate. A closed-loop drilling system would be implemented which recycles drilling fluids; cuttings would be dried through the use of a shaker system and be stacked in a cuttings trench. A traditional reserve pit would not be constructed.

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

COAs and BMPs associated with construction activities, prompt interim reclamation, and the preventative measures associated with the treatment of fluids (see Appendix A) are expected to result in only negligible potential for adverse impacts on surface water quality.

### *No Action Alternative*

The No Action Alternative would consist of denial of the APDs for the two Federal wells. Therefore, this alternative would represent a reduction of potentially 13% of the potential impacts to surface water related to the drilling and completion work. However, there would be no change from the potential impacts to surface water identified in the Proposed Action as they relate to construction of the pad, road or pipelines or the 30-year projected time period of the producing wells.

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

#### Affected Environment

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

## Environmental Consequences

### *Proposed Action*

No new crossings of jurisdictional or potentially jurisdictional Waters of the U.S. or streams that are included in the Proposed Action, nor would any construction activities be expected to result in discharges of fill into Waters of the U.S.

Improperly designed crossings of small ephemeral drainages, in particular undersized or poorly aligned culverts, could result in soil degradation that could include excessive erosion at culvert outlets, potentially supplying sediment to the Colorado River approximately 0.5 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. that could be impacted by such long-distance stormwater transport.

### *No Action Alternative*

The No Action Alternative would consist of denial of the APDs for the two Federal wells. However, because construction to accommodate the 13 planned fee wells would impact the same amount of area. Therefore, the potential for sediment impacts to the Colorado River would be essentially the same over the typical 30-year life of the wells as associated with the Proposed Action.

## ***Groundwater***

### Affected Environment

The proposed project area is located within the Division of Water Resources (DWR) Water Division 5, which encompasses Garfield County (Topper et al. 2003). The groundwater in this division is generally found in alluvial and sedimentary aquifers.

The major alluvial aquifer in the project area is the Colorado River Basin (CRB). The Colorado River represents the largest surface water outflow in the state. Alluvial groundwater is tributary to the stream system and is managed as if it were surface water. The alluvium in the Colorado River Basin generally consists of unconsolidated boulders, cobbles, gravel, sand, silt and clay. The thickness of the alluvium is variable, but tends to be thinner in the upper reaches and thicker in the lower reaches. Generally, alluvial well depths are less than 200 feet and typically range from 20 to 40 feet. The quality of alluvial groundwater in the CRB can vary widely, and is 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 major sedimentary aquifer in the project area is the Piceance Basin. The basin is a structural basin, geologically downwarped and surrounded by uplifts. The uplifting has resulted in the filling of the basin with sediments eroded from highlands. The sediments are derived from rocks of Tertiary and Late Cretaceous age. The project area lies in the southern portion of the Piceance Basin, which is drained by a number of tributary creeks that flow into the Colorado River. Most of the groundwater recharge is provided by winter precipitation and stored as snowpack at higher elevations. The sources of Piceance Basin groundwater resources in the project area are from the Mesaverde Group.

The Colorado Division of Water Resources shows four completed water wells within a 0.5-mile radius of the project area. The depths of the wells range from 125 to 300 feet, have static water levels between 72 and 110 feet below ground surface (bgs), and discharge rates ranging from 0.5 to 15 gallons per minute

(gpm). The use of the majority of wells in the area is primarily domestic: therefore it can be assumed that the quality of the water is fit for human consumption.

### Environmental Consequences

#### *Proposed Action*

Groundwater resources in the project area could be adversely affected by the drilling operations and water storage components of the Proposed Action. Contamination of groundwater could result from drilling fluids or petroleum constituents. However, isolation of water-bearing formations during the installation of production casing would minimize the effects. A review of the 10-point drilling plan associated with the Proposed Action indicates that any shallow groundwater zones encountered during drilling would be adequately protected. It is highly unlikely that the deeper groundwater resources would be affected, as the thick impermeable layers of rock at the top of the Williams Fork Formation would prevent water or hydrocarbons produced from migrating to potable water zones.

#### *No Action Alternative*

There would be no new effects from the implementation of the No Action Alternative. On-going natural gas development in the project area would be the primary source of impacts to groundwater sources. However, since the same protective measures are being implemented, impacts from the No Action Alternative would be similar to those of the Proposed Action.

### Wildlife, Aquatic

#### Affected Environment

Beaver Creek, a perennial tributary of the Colorado River, flows through the project vicinity, including approximately 75 yards from the pad site. Electrofishing surveys of this stream by CPW have documented the presence of one native trout subspecies (the Colorado River cutthroat trout, a BLM and USFS sensitive species; see the section on Special Status Species) and one introduced species, the brown trout. The brown trout, a native of Europe, has been widely introduced in mountainous areas of Colorado, especially in lower elevation waters because of its tolerance for slightly warmer temperatures than cutthroat trout.

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

### Environmental Consequences

#### *Proposed Action*

The Proposed Action would not directly affect Beaver Creek, the Colorado River, or the species that inhabit these waters. The greatest risks would be associated with spillage of produced water, condensate,

or other chemicals into Beaver Creek as a result of a truck accident. Prompt implementation of the operator's SPCC plan in combination of COAs and BMPs related to road safety would minimize this risk. More likely but of less consequence would be inflow of sediments and aerial deposition of fugitive dust into Beaver Creek as a result of its proximity to the project access road. However, COAs for dust suppression and the protection of water quality would minimize this risk (see Appendix A).

#### *No Action Alternative*

Under the No Action Alternative, impacts to aquatic wildlife would be slightly less due to the denial of the two Federal APDs. However, disturbance acres would not change and human disturbance would be only slightly reduced due to the drilling of the 13 fee wells.

### **Wildlife, Terrestrial**

#### Affected Environment

Terrestrial wildlife habitats and the baseline conditions that affect habitat availability and quality are presented in the Vegetation section of this EA. The project vicinity provides habitats for various species of big game, small game, and nongame mammals and birds that are found in low- to mid-elevation habitats of west-central Colorado.

#### *Large Mammals*

The site is located within winter range and severe winter range for both mule deer (*Odocoileus hemionus*) and Rocky Mountain elk (*Cervus elaphus nelsoni*) as mapped by CPW (2011), as well as a winter concentration area for elk. Winter range is that part of the overall range of a species where 90% of the individuals are located during the average five winters out of ten from the first heavy snowfall to spring green-up, or during a site-specific period of winter as defined for each data analysis unit (DAU) (CPW 2011). Severe winter range is that part of the range of a species where 90 percent of the individuals are located when the annual snowpack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten (CPW 2006). Elk winter concentration areas are that part of the winter range of a species where densities are at least 200% greater than the surrounding winter range density during the same period used to define winter range in the average five winters out of ten. Field surveys indicate that the project area is occupied winter range for elk and that mule deer occupy on a year-round basis.

Large carnivores present in the project vicinity include the mountain lion (*Puma concolor*) and black bear (*Ursus americanus*). CPW (2009) has mapped all of the analysis area as black bear (*Ursus americanus*) overall range. Mountain lions move seasonally to generally follow migrations of their preferred prey, mule deer. Two medium-sized carnivores, the coyote (*Canis latrans*) and bobcat (*Lynx rufus*), are also present throughout the region in open habitats and broken or wooded terrain, respectively, where they hunt for small mammals, reptiles, and ground-dwelling birds. Smaller carnivores in habitats similar to those near the project site include the ringtail (*Bassariscus astutus*) and spotted skunk (*Spilogale gracilis*).

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

### *Resident Raptors and Other Birds*

As mentioned in the section on Migratory Birds, raptors potentially nesting in the pinyon and juniper throughout the project vicinity include two small resident hawks (Cooper's hawk, sharp-shinned hawk) and, where taller conifers are present for nesting or perching, two larger resident raptors (red-tailed hawk and great horned owl). Other birds of prey potentially present include three small owls: the migratory flammulated owl (*Otus flammeotus*) and the resident northern pygmy owl (*Glaucidium gnoma*) and northern saw-whet owl (*Aegolius acadicus*), the latter two primarily where tall conifers are tall deciduous trees are present among the shrubs.

Other resident or short-distance migratory species in the project vicinity include the northern flicker (*Colaptes auratus*), common raven (*Corvus corax*), black-billed magpie (*Pica hudsonia*), American robin (*Turdus migratorius*), western meadowlark (*Sturnella neglecta*), blue-gray gnatcatcher (*Poliophtila caerulea*), and house finch (*Carpodacus mexicanus*). See the sections on Migratory Birds and Special-Status Species for discussions of other birds in the area.

### *Reptiles and Amphibians*

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

The surrounding area is also possible habitat for the Great Basin spadefoot (see the section on Special-Status Species) and two additional amphibians, the Woodhouse's toad (*Bufo woodhousii*) and western chorus frog (*Pseudacris triseriata*). Within the CRVFO and vicinity, the spadefoot toad and Woodhouse's toad occur primarily along ephemeral washes that do not support fish and contain pools of water for a period of at least a few weeks every spring. The chorus frog occurs primarily in cattail and bulrush wetlands and along the vegetated margins of seasonal or perennial ponds and slow-flowing streams.

## Environmental Consequences

### *Proposed Action*

Direct impacts to terrestrial wildlife from the Proposed Action may include mortality, disturbance, nest abandonment/nesting attempt failure, or site avoidance/displacement from otherwise suitable habitats. These effects could result from the 14.0 acres of habitat loss or modification, increased noise from vehicles and operation of equipment, increased human presence, and collisions between wildlife and vehicles. Impacts would be more substantial during critical seasons, such as winter (deer and elk) or the spring/summer breeding season (raptors, songbirds, amphibians). Deer and elk are often restricted to smaller areas during the winter months and may expend high amounts of energy to move through snow, locate food, and maintain body temperature. Disturbance during the winter can displace wildlife, depleting much-needed energy reserves and may lead to decreased over winter survival.

The greatest impact on wildlife, especially big game and raptors, would be the disturbance caused by increased human activity, equipment operation, vehicle traffic, harassment by any dogs brought to the site by contractors, and noise related to drilling and completion activities. Most species of wildlife are relatively secretive and distance themselves from these types of disturbance or move to different areas screened by vegetation screening or topographic features. This avoidance, referred to as displacement,

results in underuse of habitat near the disturbance. Avoidance of forage and cover resources adjacent to disturbance reduces habitat utility and the capacity of the affected acreage to support wildlife populations (BLM 1999a).

#### *No Action Alternative*

Under the No Action Alternative, impacts to Terrestrial Wildlife Species would be slightly less due to the denial of the two Federal APDs. However, disturbance acres would not change and human disturbance would be only slightly reduced due to the drilling of the 13 fee wells.

### **SUMMARY OF CUMULATIVE IMPACTS**

Historically, habitat loss or modification in the CRVFO areas was characteristic of agricultural, ranching lands, rural residential, with localized industrial impacts associated with the railroad and I-70 corridors and the small communities. More recently, the growth of residential and commercial uses, utility corridors, oil and gas developments, and other rural industrial uses (e.g., gravel mining along the Colorado River) has accelerated the accumulation of impacts in the area. Cumulative impacts have included (1) direct habitat loss, habitat fragmentation, and decreased habitat effectiveness; (2) increased potential for runoff, erosion, and sedimentation; (3) expansion of noxious weeds and other invasive species; (4) increased fugitive dust from construction of oil and gas pads, roads, and pipelines and associated truck travel; (5) increased noise, especially along access and haul roads; (6) increased potential for spills and other releases of chemical pollutants; and (7) decreased scenic quality.

Although none of the cumulative impacts was described in the 1999 FSEIS (BLM 1999a) as significant, and while new technologies and regulatory requirements have reduced the impacts of some land uses, it is clear that past, present, and reasonably foreseeable future actions have had and would continue to have adverse effects on various elements of the human environment. Anticipated impacts for existing and future actions range from negligible to locally major, and primarily negative, for specific resources.

The primary bases for this assessment are twofold: First, the rate of development, particularly oil and gas development, has generally been increasing in the area, resulting in an accelerated accumulation of individually nominal effects. Second, residential and commercial expansion, as well as most of the oil and gas development, has occurred on private lands where mitigation measures designed to protect and conserve resources may not be in effect to the same extent as on BLM lands. Recent COGCC regulations have closed considerably the gap between the potential environmental impacts associated with development of private versus Federal fluid mineral resources.

It is clear that the Proposed Action would contribute to the collective adverse impact for some resources. Although the contribution would be 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**

WPX Energy: Dan Collette, April Mestas, Bryan Hotard, Kris Meil, Joe Weaver, Jr.

### **INTERDISCIPLINARY REVIEW**

BLM staff from the CRVFO who participated in the preparation of this EA, including review of survey results submitted by the operator's consultants, evaluation of impacts likely to occur from implementation of the Proposed Action, and identification of appropriate COAs to be attached and enforced by BLM, are listed in Table 9.

**Table 9. BLM Interdisciplinary Team Authors and Reviewers**

<i>Name</i>	<i>Title</i>	<i>Areas of Participation</i>
Beth Brenneman	Ecologist	Invasive Non-native Species, Special Status Species (Plants), Vegetation
John Brogan	Archaeologist	Cultural Resources, Native American Religious Concerns
Jim Byers	Natural Resource Specialist	EA Project Lead, Access & Transportation, Socioeconomics, Wastes-Hazardous or Solid
Allen Crockett, Ph.D.	Supervisory Natural Resource Specialist	Technical Review, NEPA Review
Bob Hartman	Petroleum Engineer	Downhole COAs
Shauna Kocman, Ph.D.	Hydrologist	Air Quality, Noise, Soils, Surface Water, Waters of the U.S.
Julie McGrew	Natural Resource Specialist	Visual Resources
Judy Perkins, Ph.D.	Ecologist	Review: Invasive Non-native Species, Special Status Species (Plants), Vegetation
Sylvia Ringer	Wildlife Biologist	Migratory Birds, Special-status Species (Animals), Wildlife, Aquatic and Terrestrial
Todd Sieber	Geologist	Geology and Minerals, Groundwater, Paleontology

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**APPENDIX A**

**Surface Use and Downhole Conditions of Approval  
RWF 43-23 Pad**

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**SURFACE USE CONDITIONS OF APPROVAL**  
**Applications for Permit to Drill**

**RWF 43-23 PAD, DOI-BLM-CO-N040-2011-0001-EA**

1. Administrative Notification. The operator shall notify the BLM representative at least 48 hours prior to initiation of construction. If requested by the BLM representative, the operator shall schedule a pre-construction meeting, including key operator and contractor personnel, to ensure that any unresolved issues are fully addressed prior to initiation of surface-disturbing activities or placement of production facilities. No construction activities shall commence without staking of pad construction limits, pad corners, and road/pipeline centerlines and disturbance corridors.
2. Road Construction and Maintenance. The 2100-foot new access road shall be constructed with a 22-foot running surface and 4-foot ditch as staked on the ground. 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. Drill Cuttings Management. Cuttings generated from the numerous planned well bores shall be worked through a shaker system on the drill rig, mixed with a drying agent, if necessary, and deposited in the planned cuttings trench or piled on location against the cutslope for later burial during the interim reclamation earthwork. The cuttings shall be remediated per COGCC regulations (Table 910-1 standards) prior to earthwork reshaping related to well pad interim reclamation.
4. 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.
5. 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.

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.

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

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

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

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

- c. Topsoil Stripping, Storage, and Replacement. All topsoil shall be stripped following removal of vegetation during construction of well pads, pipelines, roads, or other surface facilities. In areas of thin soil, a minimum of the upper 6 inches of surficial material shall be stripped. The BLM may specify a stripping depth during the onsite visit or based on subsequent information regarding soil thickness and suitability. The stripped topsoil shall be stored separately from subsoil or other excavated material and replaced prior to final seedbed preparation. The BLM best management practice (BMP) for the Windrowing of Topsoil (COA #16) shall be implemented for well pad construction whenever topography allows.
- d. Seedbed Preparation. For cut-and-fill slopes, initial seedbed preparation shall consist of backfilling and recontouring to achieve the configuration specified in the reclamation plan. For compacted areas, initial seedbed preparation shall include ripping to a minimum depth of 18 inches, with a maximum furrow spacing of 2 feet. Where practicable, ripping shall be conducted in two passes at perpendicular directions. Following final contouring, the backfilled or ripped surfaces shall be covered evenly with topsoil.

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

If directed by the BLM, the operator shall implement measures following seedbed preparation (when broadcast-seeding or hydroseeding is to be used) to create small depressions to enhance capture of moisture and establishment of seeded species. Depressions shall be no deeper than 1 to 2 inches and shall not result in piles or mounds of displaced soil. Excavated depressions shall not be used unless approved by the BLM for the purpose of erosion control on slopes. Where excavated depressions are approved by the BLM, the excavated soil shall be placed only on the downslope side of the depression.

If directed by the BLM, the operator shall conduct soil testing prior to reseeding to identify if and what type of soil amendments may be required to enhance revegetation success. At a minimum, the soil tests shall include texture, pH, organic matter, sodium adsorption ratio (SAR), cation exchange capacity (CEC), alkalinity/salinity, and basic nutrients (nitrogen, phosphorus, potassium [NPK]). Depending on the outcome of the soil testing, the BLM may require the operator to submit a plan for soil amendment. Any requests to use soil amendments not directed by the BLM shall be submitted to the CRVFO for approval.

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

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

For private surfaces, the menu-based seed mixes are recommended, but the surface landowner has ultimate authority over the seed mix to be used in reclamation. The seed shall contain no noxious, prohibited, or restricted weed seeds and shall contain no more than 0.5 percent by weight of other weed seeds. Seed may contain up to 2.0 percent of "other crop" seed by weight, including the seed of other agronomic crops and native plants; however, a lower percentage of other crop seed is recommended. Seed tags or other official documentation shall be submitted to

BLM at least 14 days before the date of proposed seeding for acceptance. Seed that does not meet the above criteria shall not be applied to public lands.

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

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

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

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

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

- h. Erosion Control. Cut-and-fill slopes shall be protected against erosion with the use of water bars, lateral furrows, or other measures approved by the BLM. Cut-and-fill slopes along drainages or in areas with high erosion potential shall also be protected from erosion using hydromulch designed specifically for erosion control or biodegradable blankets/matting, bales, or wattles of weed-free straw or weed-free native grass hay. A well-anchored fabric silt fence shall also be placed at the toe of cut-and-fill slopes along drainages or to protect other sensitive areas from deposition of soils eroded off the slopes. Additional BMPs shall be employed as necessary to reduce soil erosion and offsite transport of sediments.
- i. Site Protection. The pad shall be fenced to BLM standards to exclude livestock grazing for the first two growing seasons or until seeded species are firmly established, whichever comes later. The seeded species will be considered firmly established when at least 50 percent of the new plants are producing seed. The BLM will approve the type of fencing.
- j. Monitoring. The operator shall conduct annual monitoring surveys of all sites categorized as “operator reclamation in progress” and shall submit an annual monitoring report of these sites to the BLM by **December 31** of each year. The monitoring program shall use the four Reclamation Categories defined in Appendix I of the 1998 DSEIS to assess progress toward reclamation objectives. The annual report shall document whether attainment of reclamation objectives appears likely. If one or more objectives appear unlikely to be achieved, the report shall identify appropriate corrective actions. Upon review and approval of the report by the BLM, the operator shall be responsible for implementing the corrective actions or other measures specified by the BLM.
8. Weed Control. The operator shall regularly monitor and promptly control noxious weeds or other undesirable plant species as set forth in the Glenwood Springs Field Office *Noxious and Invasive Weed Management Plan for Oil and Gas Operators*, dated March 2007. A Pesticide Use Proposal

(PUP) must be approved by the BLM prior to the use of herbicides. Annual weed monitoring reports shall be submitted to BLM by **December 1**.

9. Bald and Golden Eagles. It shall be the responsibility of the operator to comply with the Bald and Golden Eagle Protection Act (Eagle Act) with respect to “take” of either eagle species. Under the Eagle Act, “take” includes to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest and disturb. “Disturb” means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior. Avoidance of eagle nest sites, particularly during the nesting season, is the primary and preferred method to avoid a take. Any oil or gas construction, drilling, or completion activities planned within 0.5 mile of a bald or golden eagle nest, or other associated activities greater than 0.5 miles from a nest that may disturb eagles, should be coordinated with the BLM project lead and BLM wildlife biologist and the USFWS representative to the BLM Field Office (970-876-9051).
10. Raptor Nesting. To protect nesting raptors, a survey shall be conducted prior to construction, drilling, or completion activities that are to begin during the raptor nesting season (**February 1 to August 15**). The survey shall include all potential nesting habitat within 0.25 mile of a well pad or 0.125 mile of an access road, pipeline, or other surface facility. Results of the survey shall be submitted to the BLM. If a raptor nest is located within the buffer widths specified above, a 60-day raptor nesting TL will be applied by the BLM to preclude initiation of construction, drilling, and completion activities during the period **April 1 to May 31**. The operator is responsible for complying with the MBTA, which prohibits the “take” of birds or of active nests (those containing eggs or young), including nest failure caused by human activity (see COA for Migratory Birds).
11. Birds of Conservation Concern. Pursuant to BLM Instruction Memorandum 2008-050, all surface-disturbing activities in potentially suitable habitat for Birds of Conservation Concern (BCC) are prohibited from **May 1 to July 1**. An exception to this TL may be granted if nesting surveys conducted no more than one week prior to surface-disturbing activities indicate that no BCC species are nesting within 30 meters (100 feet) of the area to be disturbed. Nesting shall be deemed to be occurring if a territorial (singing) male is present within the distance specified above. Nesting surveys shall include an audial survey for diagnostic vocalizations in conjunction with a visual survey for adults and nests. Surveys shall be conducted by a qualified breeding bird surveyor between sunrise and 10:00 AM under favorable conditions for detecting and identifying a BCC species. This provision does not apply to ongoing construction, drilling, or completion activities that are initiated prior to May 1 and continue into the 60-day period at the same location.
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, which includes injury and direct mortality resulting from human actions not intended to have such result. To minimize the potential for the take of a migratory bird, the operator shall take reasonable steps to prevent use by birds of fluid-containing pits associated with oil or gas operations, including but not limited to reserve pits, produced-water pits, hydraulic fracturing flowback pits, evaporation pits, and cuttings trenches. Liquids in these pits—whether placed or accumulating from precipitation—may pose a risk to birds as a result of ingestion, absorption through the skin, or interference with buoyancy and temperature regulation.

Based on low effectiveness of brightly colored flagging or spheres suspended over a pit, the operator shall install netting with a mesh size of 1 to 1.5 inches, and suspended at least 4 feet above the fluid

surface, on all pits into which fluids are placed, except for storage of fresh water in a pit that contains no other material. The netting shall be installed within 24 hours following fluids release. In addition, oil slicks and oil sheens shall be promptly skimmed off the fluid surface. The requirement for prompt skimming of oil slicks and oil sheens also applies to cuttings trenches in which precipitation has accumulated. To minimize the potential for violation of the MBTA, the BLM recommends installation of netting at cuttings trenches left open for more than 24 hours following cessation of drilling and completion activities during a continuous development cycle on a pad. The recommendation for prompt netting does not apply to cuttings trenches during periods of active manipulation for cuttings management, remediation of contaminated materials, or other purposes.

All mortality or injury to birds shall be reported immediately to the BLM project lead and to the USFWS representative to the BLM Field Office at 970-243-2778 x28 and visit <http://www.fws.gov/mountain-prairie/contaminants/oilpits.htm>.

13. Fossil 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.

14. 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).

15. Visual Resources. A large berm shall be constructed along the southern edge of the access road near the pad entrance to create a visual barrier interrupting the sightline from adjacent homes.

To the extent practicable, existing vegetation shall be preserved when clearing and grading for the pad, road, and pipeline.

Above-ground facilities shall be painted **Shadow Gray** to minimize contrast with existing surrounding vegetation.

16. Windrowing of Topsoil. Topsoil shall be windrowed around the pad perimeter to create a berm that limits and redirects stormwater runoff and extends the viability of the topsoil per BLM Topsoil Best Management Practices (BLM 2009 PowerPoint presentation available upon request from Glenwood Springs Field Office). Topsoil shall also be windrowed, segregated, and stored along pipelines and roads for later spreading across the disturbed corridor during final reclamation. Topsoil berms shall be promptly seeded to maintain soil microbial activity, reduce erosion, and minimize weed establishment.

17. Interim Reclamation Related to Drilling Phases. Within 1 year of completion of all exploratory wells proposed on a pad or within one year of completion of all development wells on a pad (whichever the situation may be), the operator would stabilize the disturbed area by recontouring, mulching, providing run-off and erosion control, replacing topsoil as directed, and seeding with BLM-prescribed native seed mixes (or landowner requested seed mix on Fee surface), and conducting weed control, as necessary. In cases where the exploratory drilling and development drilling on a single pad occur

more than 1 year apart, slopes shall be recontoured to the extent necessary to accommodate seeding, and seed mixes required by BLM or requested by the private landowner shall be applied to stabilize the soil between visits per direction of the BLM.

18. Road and Pad Construction Details. Install culverts in the existing irrigation ditches to allow unabated flows of ditches during seasons of use.

During prework meeting for road, implement run-on protection and diversion of surface water flow at northeast pad corner.

Design excess material stockpile from pit excavation to serve as light and noise barrier/berm reducing potential impacts to the neighboring residence.

Design and construct the southwestern corner of the pad to allow the existing drainage to flow unabated through and around the excess material pile.

Fence the pad prior to construction to avoid conflicts with pastured animals nearby.

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

**Company/Operator: Williams Production RMT**

**Well Pad Surface Location:** NE $\frac{1}{4}$ SE $\frac{1}{4}$ , Section 23, T6S, R94W, Garfield County

**Well: RWF 42-23, SE $\frac{1}{4}$ NE $\frac{1}{4}$ , Section 23, T6S, R94W**  
**Lease COC 2799**

**Well: RWF 32-23, SW $\frac{1}{4}$ NE $\frac{1}{4}$ , Section 23, T6S, R94W**  
**Lease COC57943**

See list of wells following the COAs.

1. Twenty-four hours *prior* to (a) spudding, (b) conducting BOPE tests, (c) cementing/running casing strings, and (d) within 24 hours *after* spudding, the CRVFO shall be notified. One of the following CRVFO inspectors shall be notified by phone. The contact number for all notifications is: 970-876-9064. The BLM CRVFO inspectors are Julie King, Lead PET; David Giboo, PET; Greg Rios, PET; and Tim Barrett, PET.
2. A CRVFO petroleum engineer shall be contacted for a verbal approval prior to commencing remedial work, plugging operations on newly drilled boreholes, changes within the drilling plan, sidetracks, changes or variances to the BOPE, deviating from conditions of approval, and conducting other operations not specified within the APD. Contact, Bob Hartman at 970-244 3041 (office) or 970-210-2374 (cell) for verbal approvals.
3. If a well control issue or failed test (e.g. kick, blowout, water flow, casing failure, or a bradenhead pressure increase) arises during drilling or completions operations, Bob Hartman at 970-244 3041 (office) or 970-210-2374 (cell) shall be notified within 24 hours from the time of the event. IADC/Driller's Logs and Pason Logs (mud logs) shall be forwarded to CRVFO – Petroleum Engineer, 2300 River Frontage Road, Silt, CO 81652 within 24 hours of a well control event.
4. The BOPE shall be tested and conform to Onshore Order No. 2 for a 3000 psi system.
5. An electrical/mechanical mud monitoring equipment shall be function tested prior to drilling out the surface casing shoe. As a minimum, this equipment shall include a trip tank, pit volume totalizer, stroke counter, and flow sensor.
6. Prior to drilling out the surface casing shoe, gas detecting equipment shall be installed in the mud return system. The mud system shall be monitored for hydrocarbon gas/pore pressure changes, rate of penetration, and fluid loss.
7. A gas buster shall be functional and all flare lines effectively anchored in place, prior to drilling out the surface casing shoe. The discharge of the flare lines shall be a minimum of 100 feet from the wellhead and targeted at bends. The panic line shall be a separate line (not open inside the buffer tank) and effectively anchored. All lines shall be downwind of the prevailing wind direction and directed into a flare pit, which cannot be the reserve pit. The flare system shall use an automatic ignition. Where noncombustible gas is likely or expected to be vented, the system shall be provided supplemental fuel for ignition and maintain a continuous flare.

8. As a minimum, cement shall be brought to 200 feet above the Mesaverde. After WOC for the production casing, a CBL shall be run to verify the TOC and an electronic copy in .las and .pdf format shall be submitted to CRVFO – Petroleum Engineer, 2300 River Frontage Road, Silt, CO 81652 within 48 hours. If the TOC is lower than required or the cement sheath of poor quality, a CRVFO petroleum engineer shall be notified for remedial operations within 48 hours from running the CBL and prior to commencing fracturing operations,
9. On the first well drilled on this pad, a triple combo open-hole log shall be run from the base of the surface borehole to surface and from TD to bottom of surface casing shoe. This log shall be in submitted within 48 hours in .las and .pdf format to: CRVFO – Todd Sieber, 2300 River Frontage Road, Silt, CO 81652. Contact Todd Sieber at 970-876-9000 or [asieber@blm.gov](mailto:asieber@blm.gov) for clarification.
10. Submit the (a) mud/drilling log (e.g. Pason disc), (b) driller's event log/operations summary report, (c) production test volumes, (d) directional survey, and (e) Pressure Integrity Test results within 30 days of completed operations (i.e. landing tubing) per 43 CRF 3160-9 (a).
11. Prior to commencing fracturing operations, the production casing shall be tested to the maximum anticipated surface treating/fracture pressure and held for 15 minutes without a 2% leak-off. If leak-off is found, Bob Hartman 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.
12. During hydraulic frac operations, monitor the bradenhead/casing head pressures throughout the frac job. Frac operations shall be terminated upon any sharp rise in annular pressure (+/- 40 psi or greater) in order to determine well/wellbore integrity. Notify BLM Bob Hartman at 970-244 3041 (office) or 970-210-2374 (cell) immediately.

# FONSI

## DOI-BLM-CO-N040-2011-0001-EA

The Environmental Assessment (EA) analyzing the environmental effects of the Proposed Action has been reviewed. The project design and approved mitigation measures result in a Finding of No Significant Impact (FONSI) 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 as described and analyzed in this EA.

RATIONALE: The bases for this decision are as follows:

1. This decision will provide for the orderly, economical, and environmentally sound exploration and development of oil and gas resources on Federal oil and gas leases.
2. Approval of the Proposed Action validates the rights granted with the Federal oil and gas leases to develop the leasehold to provide commercial commodities of oil and gas.
3. Environmental impacts will be avoided or minimized through protective lease stipulations and by the best management practices and mitigation measures included in the Proposed Action or otherwise applied and enforced by BLM as Conditions of Approval (COAs).
4. This decision does not authorize the initiation of surface-disturbing activities on BLM lands or the development of new Federal oil and gas wells on new or existing well pads. Surface-disturbing activities on BLM lands and development of Federal wells will not commence until approval by BLM of Applications for Permits to Drill (APDs) or issuance by BLM of right-of-way grants pursuant to this EA.

MITIGATION MEASURES: Mitigation measures presented in Appendix A of the EA will be incorporated as COAs for both surface and drilling operations and attached to APDs for the Federal wells drilled on the proposed well pad.

NAME OF PREPARER: Jim Byers, Natural Resource Specialist

SIGNATURE OF AUTHORIZED OFFICIAL:



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

DATE: April 21, 2012