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-N040-2011-0080-EA

CASEFILE NUMBER: COC07506 (Oil and Gas Lease)

PROJECT NAME: Proposal to drill six Federal wells from the proposed RWF 11-35 well pad and eight Federal wells from the existing RMV 15-35 well pad, both located on private land south of the town of Rifle, Garfield County, Colorado.

LOCATION: Township 6 South (T6S), Range 94 West (R94W), Section 35, Sixth Principal Meridian (Figures 1 and 2).

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

Table 1. Surface and Bottomhole Locations of Proposed Federal Wells

RMV 15-35 Well Pad		
Proposed Wells	***Surface Locations (Section 35, T6S, R94W)***	***Bottomhole Locations (Section 35, T6S, R94W)***
RWF 312-35	2,001 feet FNL, 541 feet FWL	1,840 feet FNL, 649 feet FWL
RWF 23-35	2,038 feet FNL, 535 feet FWL	2,602 feet FSL, 1943 feet FWL
RWF 522-35	2,031 feet FNL, 536 feet FWL	2,324 feet FNL, 1956 feet FWL
RWF 323-35	2,053 feet FNL, 532 feet FWL	2,294 feet FSL, 1917 feet FWL
RWF 12-35	1,994 feet FNL, 542 feet FWL	1,535 feet FNL, 685 feet FWL
RWF 22-35	2,023 feet FNL, 537 feet FWL	2,016 feet FNL, 1950 feet FWL
RWF 412-35	2,060 feet FNL, 531 feet FWL	2,431 feet FNL, 529 feet FWL
RWF 422-35	2,016 feet FNL, 539 feet FWL	1,710 feet FNL, 1971 feet FWL
RWF 11-35 Well Pad		
Proposed Wells	***Surface Locations (Section 35, T6S, R94W***	***Bottomhole Locations***
RWF 11-35	To Be Determined	NWNW Sec. 35 T6S R94W
RWF 21-35	To Be Determined	NENW Sec. 35 T6S R94W
RWF 311-35	To Be Determined	NWNW Sec. 35 T6S R94W
RWF 321-35	To Be Determined	NENW Sec. 35 T6S R94W
RWF 411-35	To Be Determined	NWNW Sec. 35 T6S R94W
RWF 421-35	To Be Determined	NENW Sec. 35 T6S R94W

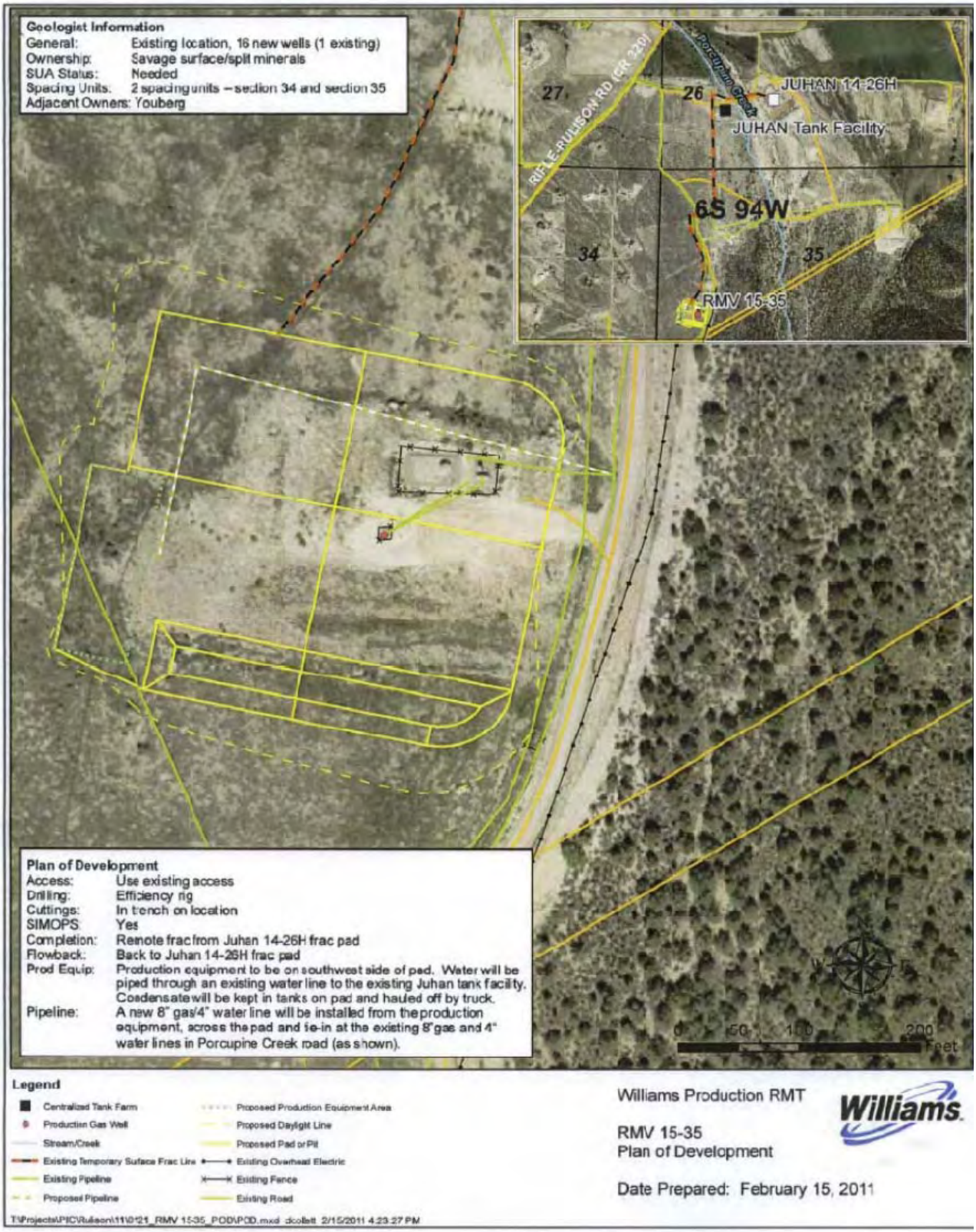


Figure 1. RMV 15-35 Location Map

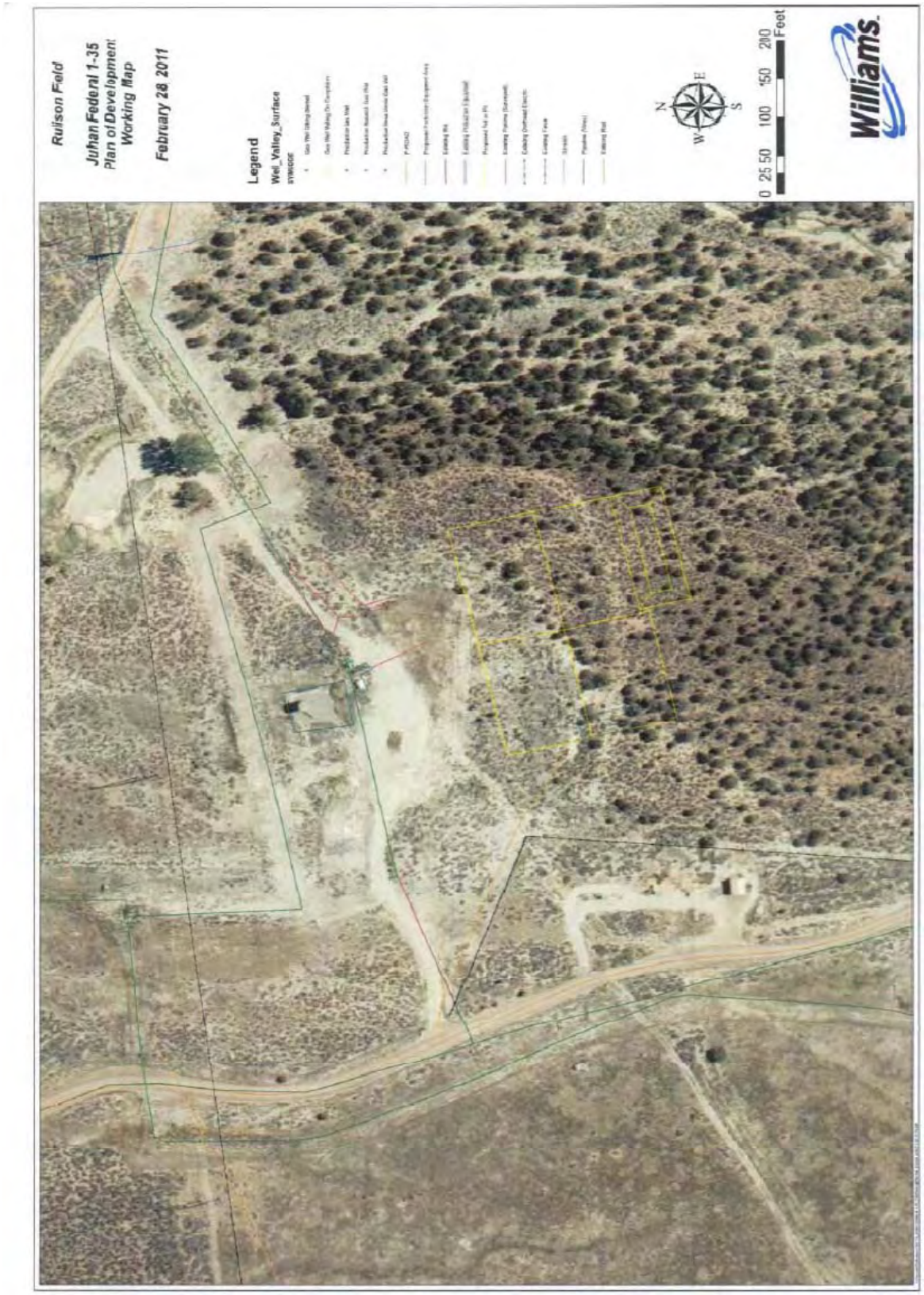


Figure 2. RWF 11-35 Location Map

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

PROPOSED ACTION

Williams Production RMT Company ("Williams") proposes to drill and develop eight Federal oil and gas wells from the existing RMV 15-35 well pad and six Federal oil and gas wells from the proposed RWF 11-35 well pad, both located on private land about 5.5 miles southwest of Rifle, Colorado. The Federal wells would be directionally drilled from both locations into underlying Federal lease COC07506. A gas-gathering pipeline is in place along the existing access road. Construction plats for pads RWF 11-35 and RMV 15-35 are provided as Figures 3 and 4, respectively.

The RMV 15-35 well pad currently supports one existing well, and eight additional Fee wells are planned in addition to the eight Federal wells. Expected short-term disturbance for the RMV 15-35 pad and access road would be 5.0 acres, all of which would be on private surface and within the original surface disturbance area. Following interim reclamation, the area of long-term disturbance would be reduced to 1.1 acres. The access road, County Road 320 (CR 320), is maintained by Garfield County. A new 8-inch diameter natural gas pipeline and a new 4-inch diameter water pipeline would be buried 3 to 4 feet deep from the production equipment, across the pad and tie into the existing 8-inch diameter natural gas line and 4-inch diameter natural gas lines in Porcupine Creek road. Produced water would be conveyed via pipeline to the Juhan tank pad north of the well pad locations, less than 1 mile away. Condensate would be collected on the pad in tanks and trucked to an approved facility. The wells would be simultaneously drilled and completed using conventional drilling techniques. Drill cuttings from the 8 wells would be deposited in a 5,000-cubic-yard cuttings trench excavated along the southern side of the pad. After cuttings are dried and meet Colorado Oil and Gas Conservation Commission (COGCC) specifications, they would be hauled by truck to an approved disposal site. The completion work would occur on the pad using hydraulic fracturing ("frac") water conveyed in a surface line (4-inch in diameter) from the Juhan 14-26H Frac pad, a distance of approximately a mile. Separators would be located along the western edge of the pad. The northwest and southeast corners of the pad would be pulled back at the time of interim reclamation.

The RWF 11-35 well pad, also located on private surface, was formerly known as the Juhan Federal 1-35 well pad, with one Federal existing well originally drilled by Vaquero Oil and Gas. The proposed activity would result in disturbance of the southern portion of the old pad that is now in interim reclamation and new disturbance south of the original pad. The new disturbance would be approximately 2.5 acres, and the total pad size would be 2.8 acres during drilling and completion operations. Long-term disturbance of the pad would be 1.5 acres, in addition to the long-term disturbance of the Vaquero well pad.

The proposed wells for the RWF 11-35 pad would tie into the proposed new 8-inch diameter natural gas line and the new 4-inch diameter waterline, both described above. Both lines would be buried from the main road, along the spur road to the production equipment located on the west side of the pad.

The Proposed Action would include drilling and completion operations, production of natural gas and associated liquid condensate, proper handling and disposal of produced water, and intermediate and final reclamation. The Proposed Action would be implemented consistent with the 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 (COAs) that would be implemented as mitigation measures for this project. The operator would be responsible for continuous inspection and maintenance of the pad, access roads, and pipelines.

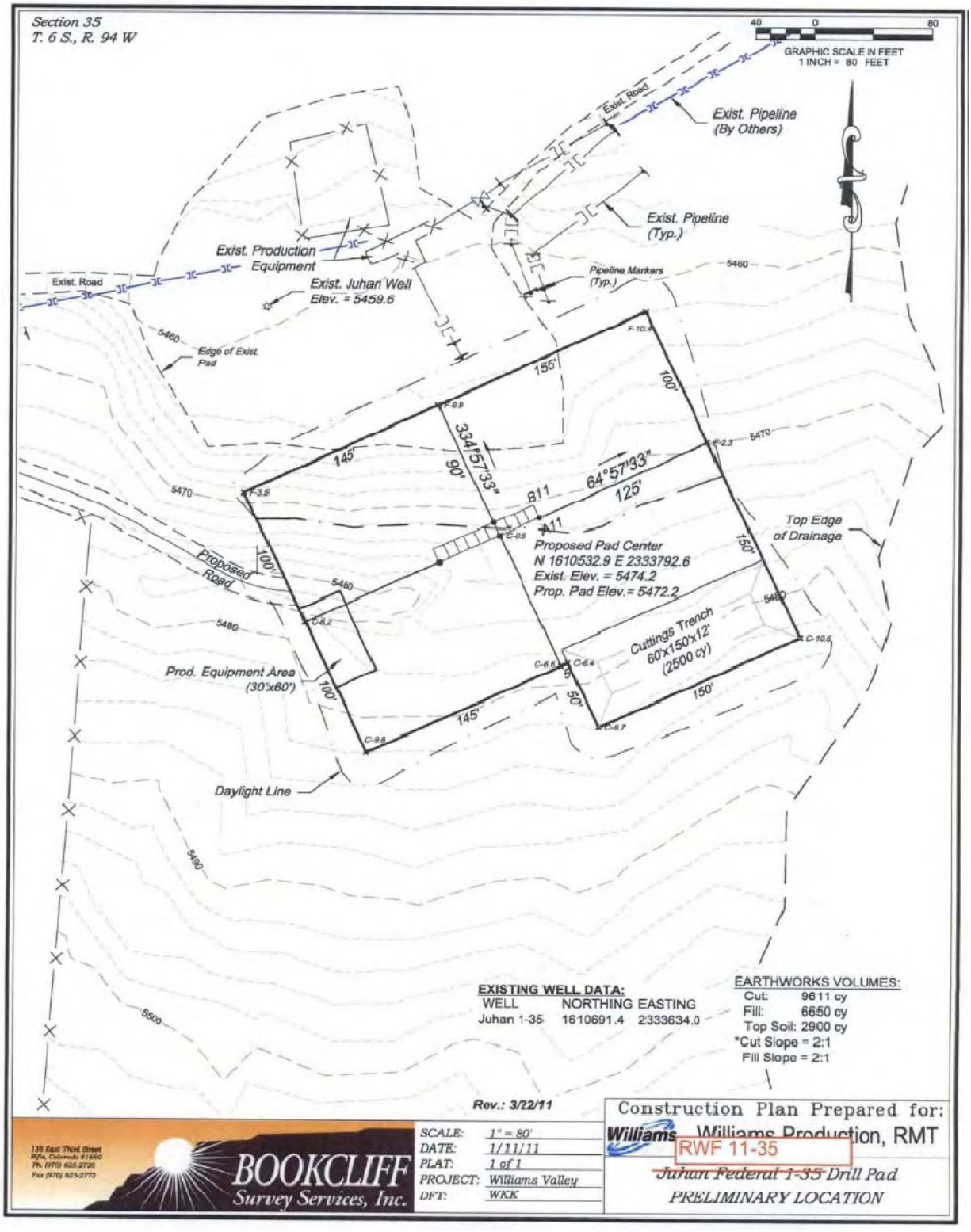
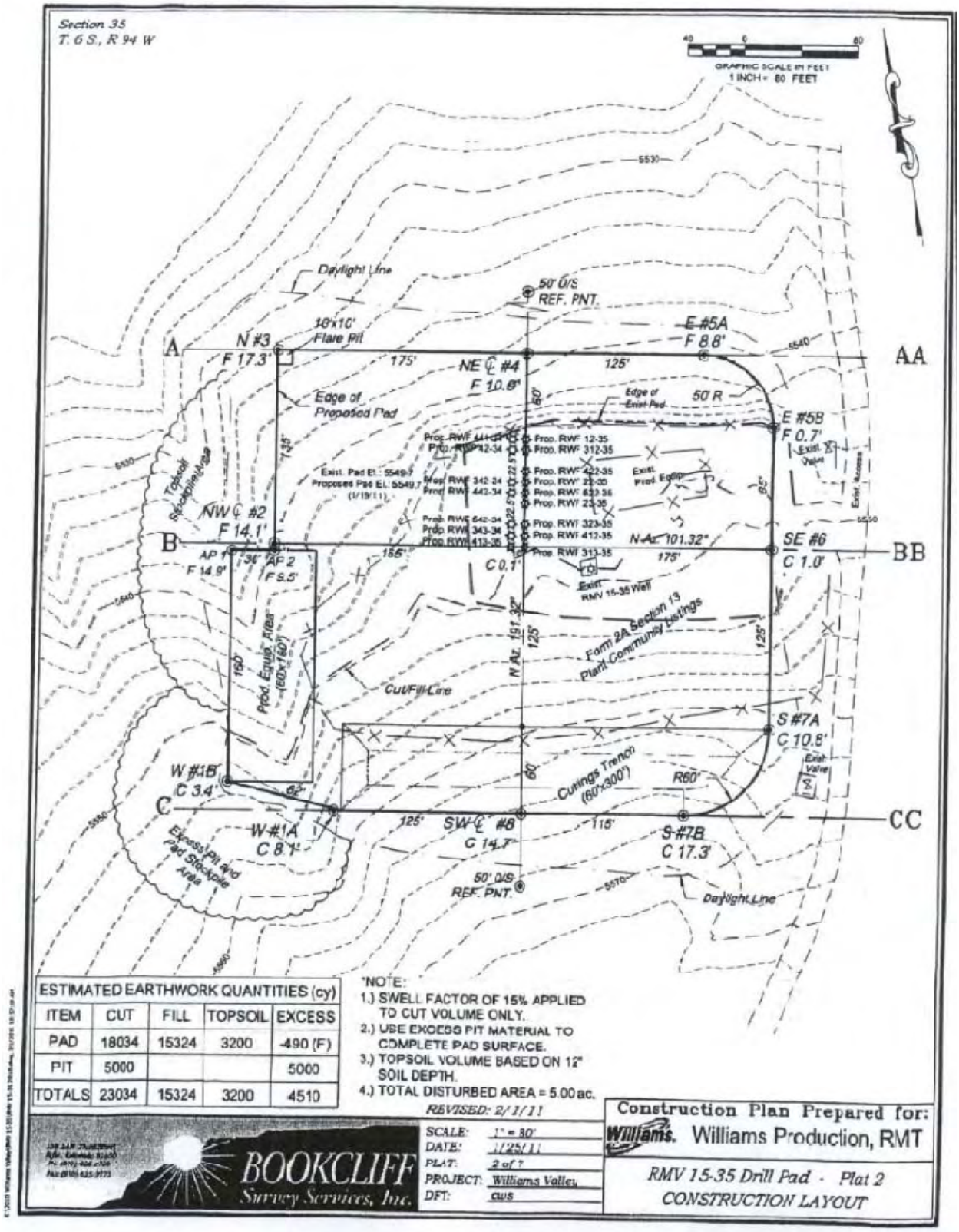


Figure 3. RWF 11-35 Well Pad Construction Plat



ESTIMATED EARTHWORK QUANTITIES (cy)				
ITEM	CUT	FILL	TOPSOIL	EXCESS
PAD	18034	15324	3200	-490 (F)
PIT	5000			5000
TOTALS	23034	15324	3200	4510

NOTE:
1.) SWELL FACTOR OF 15% APPLIED TO CUT VOLUME ONLY.
2.) USE EXCESS PIT MATERIAL TO COMPLETE PAD SURFACE.
3.) TOPSOIL VOLUME BASED ON 12" SOIL DEPTH.
4.) TOTAL DISTURBED AREA = 5.00 ac.

REVISED: 2/1/11

BOOKCLIFF Survey Services, Inc.

SCALE: 1" = 80'
DATE: 1/25/11
PLAT: 2 of 7
PROJECT: Williams Valley
DFT: cws

Construction Plan Prepared for: Williams. Williams Production, RMT

RMV 15-35 Drill Pad - Plat 2
CONSTRUCTION LAYOUT

Figure 4. RMV 15-35 Well Pad Construction Plat

Construction of the spur roads leading onto the pads and any additional surface-disturbing activities would conform to standards established in the BLM Gold Book, *Surface Operating Standards for Oil and Gas Exploration and Development* (USDI and USDA 2007). A road maintenance program during the production phase of the wells would include blading, ditching, culvert installation and cleanout, weed control, and application of additional gravel where excessive rutting or erosion occurs. Roads would be maintained in a safe and useable condition.

NO ACTION ALTERNATIVE

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

PURPOSE AND NEED FOR THE ACTION

The purposed of the action is to develop oil and gas resources on Federal lease COC07506 consistent with existing Federal lease rights. The action is needed to increase the development of oil and gas resources for commercial marketing to the public

SUMMARY OF LEASE STIPULATIONS

The 14 proposed Federal wells would be directionally drilled from the existing RMV 15-35 and RWF 11-35 pads located on private surface owned by Mr. Savage with underlying Federal mineral estate. The lease, issued in 1953, does not contain any specific lease stipulations. Any protective stipulations added by BLM are site-specific Conditions of Approval (COAs) presented in Appendix A.

PLAN CONFORMANCE REVIEW

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

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

Date Approved: Amended in November 1991 – Oil and Gas Leasing and Development – Final Supplemental Environmental Impact Statement; amended in March 1999 – Oil and Gas Leasing & Development Final Supplemental Environmental Impact Statement.

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

Decision Language: “697,720 acres of BLM-administrated mineral estate within the Glenwood Springs Resource Area are open to oil and gas leasing and development, subject to lease terms and (as applicable) lease stipulations.” This decision was carried forward unchanged in the 1999 RMP amendment (BLM 1999).

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

STANDARDS FOR PUBLIC LAND HEALTH

In January 1997, Colorado BLM approved the Standards for Public Land Health. The five standards cover upland soils, riparian systems, plant and animal communities, threatened and endangered species, and water quality. Standards describe conditions needed to sustain public land health and relate to all uses of the public lands. A BLM environmental assessment (EA) must address whether the Proposed Action or alternatives being analyzed would result in impacts that would maintain, improve, or deteriorate land health conditions relative to these resources. These analyses are conducted in relation to baseline conditions described in land health assessments (LHAs) completed by the BLM. However, because the Proposed Action would occur on private lands, an analysis of the project in relation to Land Health is not required.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section provides a description of the human and natural environmental resources that could be affected by the Proposed Action and No Action Alternative. In addition, the section presents comparative analyses of the direct and indirect consequences on the affected environment stemming from the implementation of the various actions. A variety of laws, regulations, and policy directives mandate the evaluation of the effects of a Proposed Action and alternative(s) on environmental elements of the human environment that are present and potentially adversely affected by a project. The following resources and uses are addressed, in alphabetical order, in this EA:

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

Resources and uses not listed above are not present or, if present, would not be affected by the project and therefore are not addressed in this EA.

Access and Transportation

Affected Environment

The project area is accessed from the BLM office in Silt, Colorado, by driving on I-70 west and exiting at Rifle (Exit 87), following the Rifle-Rulison Road (CR 320) to the intersection of Porcupine Road (CR 325). From this point, the access route continues south on CR 325 for 0.5 miles and the first pad, RWF 11-35, is located on the east side of CR 325. A small spur road accesses the pad from the main road, less than 400 feet. Continuing south on CR 325, the RMV 15-35 well pad is located on the west side of CR 325. Public access to the project vicinity is available along the county roads listed above. The existing access roads would provide access to the area in its present condition and alignment.

Environmental Consequences

Proposed Action

The Proposed Action would result in a substantial temporary increase in truck traffic and a less substantial long-term increase compared to existing traffic associated with the two existing wells, one on each pad. An estimated 1,160 truck trips over a 30-day period would be required to support the drilling and completion of the proposed Federal wells (Table 2). Once the wells are in production, traffic would decrease to occasional visits for monitoring or maintenance activities. The wells are assumed to require recompletion once per year. Each recompletion would require three to five truck trips per day for approximately 7 days. Fluids generated during the life of the well would be stored in tanks onsite, increasing the number of water and oil truck traffic related to the haulage of fluids.

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

Table 2. Traffic Associated with Drilling and Completion Activities

Vehicle Class	*Number of trips per well*	*Percentage of total*
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.

No Action Alternative

This alternative would not affect access or transportation other than those associated with the long-term production and maintenance of the two existing Fee wells (one on RMV 15-35 and one on RWF 11-35) and with any new Fee wells drilled under the authority of the COGCC.

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_2), ozone (O_3), particulate matter less than 10 microns (μ) in diameter (PM_{10}) and less than 2.5 μ in diameter ($PM_{2.5}$), and sulfur dioxide (SO_2).

The project area lies within Garfield County, which has been described as an attainment area under CAAQS and NAAQS. An attainment area is an area where ambient air pollution quantities are below

(i.e., better than) NAAQS standards. As shown in Table 3, regional background values are well below established standards, and all areas within the cumulative study area are designated as attainment for all criteria pollutants. Federal air quality regulations are enforced by the Colorado Department of Public Health and Environment (CDPHE). The Prevention of Significant Deterioration (PSD) Program within CDPHE is designed to limit incremental increases for specific air pollutant concentrations above a legally defined baseline level, as defined by an area's air quality classification. Incremental increases in PSD Class I areas are strictly limited.

Air pollutants measured in the region for which ambient air quality standards exist include carbon monoxide (CO), nitrogen dioxide (NO2), ozone (O3), particulate matter less than 10 microns (μ) in diameter (PM10) and less than 2.5 μ in diameter (PM2.5), and sulfur dioxide (SO2). 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 Prevention of Significant Deterioration (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 restrictions on allowable increases in Class II areas are less strict.

The NCSMDP area and surrounding areas are classified as PSD Class II. The PSD Class I areas located within 100 miles of the NCSMDP area are Flat Tops Wilderness (approximately 25 miles north), Maroon Bells – Snowmass Wilderness (approximately 35 miles south), West Elk Wilderness (approximately 60 miles southeast), Black Canyon of the Gunnison National Monument (approximately 65 miles south), and Eagles Nest Wilderness (approximately 60 miles east). Dinosaur National Monument (approximately 80 miles northwest) is listed as a Federal Class II area but is regulated as a Class I area for SO_2 by CDPHE. Regional background pollutant concentrations and applicable standards or limits are listed in Table 3**.**

Table 3. Air Pollutant Background Concentrations, Colorado and National Ambient Air Quality Standards, and Prevention of Significant Deterioration Increments.

Pollutant/Averaging Time		***Measured Background***	***CAAQS and/or NAAQS***	***Incremental Increase Above Legal Baseline***	
Carbon Monoxide (CO) [1]	1-hour 8-hour	1,160 μg/m^3 1,160 μg/m^3	40,000 μg/m^3 (35 ppm) 10,000 μg/m^3 (9 ppm)	n/a n/a	n/a n/a
Nitrogen Dioxide (NO_2) [2]	Annual Arithmetic Mean	10 μg/m^3	100 μg/m^3 (0.053 ppm)	2.5 μg/m^3	25 μg/m^3
Ozone[3]	8-hour	0.076 ppm (highest)	0.075 ppm	n/a	n/a
Particulate Matter (PM_{10}) [1]	24-hour	114 μg/m^3 (highest)	150 μg/m^3	8 μg/m^3	30 μg/m^3
Particulate Matter ($PM_{2.5}$) [4]	24-hour Annual	40 μg/m^3 (highest) 11.2 μg/m^3	35 μg/m^3 15 μg/m^3	n/a n/a	n/a n/a
Sulfur Dioxide (SO_2) [5, 6]	3-hour 24-hour Annual	24 μg/m^3 13 μg/m^3 5 μg/m^3	1,300 μg/m^3 (0.5 ppm) 365 μg/m^3 (0.14 ppm) 80 μg/m^3 (0.03 ppm)	25 μg/m^3 5 μg/m^3 2 μg/m^3	512 μg/m^3 91 μg/m^3 20 μg/m^3

[1] Background data collected in Rifle, 2008; highest levels recorded in April (Air Resource Specialists 2009).
[2] Background data collected by EnCana at site north of Parachute, 2007 (CDPHE 2008).
[3] Background data collected in Rifle, 2008; highest levels recorded in July (Air Resource Specialists 2009).
[4] Background data collected in Rifle, September – December 2008; highest levels recorded in December (Air Resource Specialists 2009).
[5] Background data collected at Unocal site, 1983-1984 (CDPHE 2008).
[6] Colorado 3-hour AAQS = 700 μg/m^3.

Environmental Consequences

Proposed Action

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

Air quality would decrease during expansion of the RWF 11-35 pad, construction of access roads and pipelines and drilling of RWF 11-35 and RMV 15-35 wells. Both RWF 11-35 and RMV 15-35 are existing pads and private surface. Pollutants generated during these activities would include combustion emissions and fugitive dust associated with construction equipment and vehicles. Construction activities for the well pads, access road, and pipelines would occur between the hours of 7:00 a.m. and 6:00 p.m. each day for a period of four to five weeks. 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 of volatile organic compounds (VOCs) are dependent on the characteristics of the condensate, tank operations, and production. The air impacts associated with the condensate tanks are anticipated to be minor, but VOC emissions would be controlled under CDPHE Regulation 7. This includes capture and thermal disruption of VOCs from condensate tanks.

The Roan Plateau RMPA/EIS describes potential effects from oil and gas development (BLM 2006:4-26 to 4-37). Analysis was completed with regard to greenhouse gas emissions, a near-field and far-field analysis for "criteria pollutants" (particulate matter [PM_{10} and $PM_{2.5}$], carbon monoxide, sulfur dioxide, and nitrogen oxides) and hazardous air pollutants (benzene, ethylbenzene, formaldehyde, hydrogen sulfide, toluene, and xylenes. Sulfur and nitrogen deposition, acid neutralizing capacity, and a visibility screening analysis were also completed in the Roan Plateau RMPA/EIS. Because the visibility screening analysis showed potential impacts at one or more Class I areas, a refined visibility analysis was also completed. The refined visibility analysis indicated a "just noticeable" impact on visibility for one day each at two Class I areas (Black Canyon of the Gunnison National Park and the Mt. Zirkel Wilderness). For the other pollutants analyzed, the implementation of oil and gas development under the Roan Plateau RMPA/EIS were calculated as having no or negligible long-term adverse impacts on air quality. The Proposed Action is within the scale of development anticipated in the Roan Plateau RMPA/EIS.

Two aspects of BLM's use of the air modeling for the Roan Plateau RMPA/EIS bear elaboration. First, with regard to wells located outside the Roan planning area, such as on the two pads associated with the Proposed Action, BLM has determined that the entire CRVFO oil and gas development area along the I-70 corridor is within the same airshed and that pollutants emitted anywhere within that area have the same potential for far-field cumulative impacts as those emitted within the Roan Plateau planning area. Second, the number of APDs approved by BLM as of the date of this EA is below the total number analyzed in the Roan Plateau RMPA/EIS. When the number of wells analyzed for the Roan Plateau RMPA/EIS has been reached, the BLM will no longer approve new APDs by reference to the Roan modeling. Instead, the BLM anticipates using the new air modeling conducted for the RMP revision currently underway as the basis for analyzing project-related air impacts.

Activities described in the Proposed Action would result in localized short-term increases in pollutant emissions from vehicles and drilling equipment and fugitive dust emissions from construction and use of the well pad and access road. Concentrations would be below applicable ambient air quality standards as analyzed in the Roan Plateau RMPA/EIS. However, construction, drilling, and production activities could produce high levels of fugitive dust in dry conditions without dust abatement. To mitigate dust generated by these activities, the operator would be required to implement dust abatement strategies as needed by watering the access road and construction areas and/or by applying a surfactant approved by the BLM (Appendix A). Additionally, the operator would be required to apply gravel to the access road to a compacted depth of 6 inches, further reducing fugitive dust emissions (Appendix A).

Since the current land use plan was approved BLM (1999), ongoing scientific research has identified the potential impacts of "greenhouse gases" (GHGs) and their effects on global atmospheric conditions. These GHGs include carbon dioxide, methane, nitrous oxide, water vapor, and several trace gases. Through complex interactions on a global scale, these GHG emissions are believed by many experts to cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the Earth back into space.

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

The assessment of GHG emissions and climate change remains in its formative phase. Therefore, it is not yet possible to know with certainty the net impact to climate from GHGs produced globally over the last century or from those produced today. The lack of scientific tools designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts of climate change on the specific area of the Proposed Action. In addition, while any oil and gas leasing or development projects may contribute GHGs to the atmosphere, these contributions would not have a significant effect on a phenomenon occurring at the global scale believed by some to be due to more than a century of human activities.

No Action Alternative

Under the No Action Alternative, the proposed Federal wells described in the Proposed Action would be drilled, but the Fee wells would be drilled. Noise and pollutants associated with the long-term production and maintenance of the existing Fee well on each pad with any new Fee wells drilled under the authority of the COGCC would still occur.

Cultural Resources (Archaeology)

Affected Environment

Three Class III cultural resource investigations (intensive pedestrian inventories) identified as CRVFO Nos. 1111-27, 16809-2, and 9485 have been conducted in the vicinity of the RMV 15-35 and RWF 11-35 well pads. One "isolated find" was identified as being located within the project area. Isolated finds are by definition not eligible to the National Register of Historic Properties (NRHP). No "historic properties"

were identified in the area of potential disturbance for this project. "Historic properties" are cultural resources that are eligible or potentially eligible for inclusion on the NRHP.

Environmental Consequences

Proposed Action

Implementation of the Proposed Action would have no direct impacts to known "historic properties," since none is present in any of the areas of proposed ground disturbance. Therefore, the BLM has 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)]. Because the BLM has determined that the Proposed Action would have no direct impacts to known "historic properties," no formal consultation was initiated with the SHPO.

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

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

No Action Alternative

The No Action Alternative constitutes denial of the Federal APDs described in the Proposed Action. Under the No Action Alternative, the Federal wells proposed and described in the Proposed Action would not be drilled; however, future Fee wells could be drilled under approval from COGCC.

Geology and Minerals

Affected Environment

The two existing well pads are located along the southern edge of the Piceance Basin on the northern flanks of Battlement Mesa. Battlement Mesa is a large, prominent highland that stretches for approximately 20 miles east-west and sits along the Garfield-Mesa county line between the Colorado River to the north and Plateau Creek to the south. It is visible similar in geology to the nearby Grand Mesa to the southwest, consisting largely of basalt-capped sedimentary rocks of the Green River and Uinta Formations. Table 4 lists the formations that crop out along or near the project site.

The Cretaceous Mesaverde Group is the target zone of the proposed drilling program. Comprising the Iles and Williams Fork Formations, the Mesaverde Group is composed of marine sandstones transitional to non-marine beds of coal, shale, and sandstone that were deposited marginal to the great Cretaceous seaway (Warner 1964) that occupied much of the Western Interior region during that time. The oscillating shoreline of this sea, due to the rise and fall of sea level, left behind a complex of transgressive and regressive sedimentary sequences of onshore, nearshore, and offshore sediments.

The orogenic (mountain-building) processes that also took place during the late Cretaceous produced uplift and subsidence structures in central and eastern Utah, western Colorado, and most of Wyoming As the highland areas were exposed to erosion and the basin deepened, a greater amount of sediment was available for deposition along the ancient shoreline. The subsequent facies (textural) changes that occurred as a result of these two processes are believed to be the trapping mechanism that defines the extensive gas accumulation of the Williams Fork Formation. The source rocks are interbedded and thermally mature gas-prone shales, mudstones, siltstones, and coals. The reservoir rocks are fine- to medium-grained sandstones, varying in thickness from less than 10 feet to more than 50 feet (Spencer 1988), creating an interbedded relationship between source and reservoir. The trapping mechanism of the tight gas is both stratigraphic and diagenetic (post-depositional).

Production is derived from three reservoir intervals, which include the Wasatch Formation, the Williams Fork Formation, and Iles Formation. The latter two make up the Upper Cretaceous Mesaverde Group. Mesaverde Group reservoirs are tight throughout most of the Piceance Basin, and generally become tighter with depth of burial (Spencer 1983). Substantial reserves have been known since the late 1950s to be trapped within the tight sands of these reservoirs. However, only within the last decade, and particularly within the last few years, has the integrated application of new technologies turned the tight gas sands into a profitable play (Kuuskraa 1997). Natural fracture detection, advanced log analysis, more rigorous well completions and recompletions, and denser spacing have increased the amount of recoverable gas within these reservoirs.

Table 4. Surficial Geologic Formations in the Study Area

Map Symbol	*Formation Name*	*Age*	*Characteristics*	*Location*
Qal	Alluvium	Holocene	Mud, silt sand and gravel.	Alluvial valley fill and terraces
Qgmf	Mudflow deposits	Holocene	Mud and fan-gravel.	Hill slopes / flanks alluvial fans.
Tws	Shire Member of the Wasatch Formation	Eocene	Purple, lavender, red, gray and brown claystone.	Out-crop exposures north and west of site.

Source: Donnell et al. (1989)

Environmental Consequences

Proposed Action

Implementation of the proposed development program would result in natural gas and associated water being produced from the tight gas sands of the Mesaverde Group. The amount of natural gas that may be potentially produced can only be estimated based on production rates from nearby wells and adjacent fields. Reserves have been estimated to approach 2 billion cubic feet (bcf) of natural gas per well (Vargas 2006). If the wells become productive, initial production rates would be expected to be highest during the first few years of production, then steadily decline during the remainder of the economic lives of the wells. Most of the wells currently in production are estimated to have a life span of 30 to 35 years. See the section on Surface Water for requirements regarding disposal of produced water.

Specific casing depths would vary depending on well location and drilling conditions. Surface casing used to protect and isolate usable water and potential production zones would be set at depths substantially below known aquifers within the area. If a water-bearing, gas-producing, lost-circulation, or

pressurized zone is encountered below the surface casing, cement volumes would be adjusted to protect and further isolate those zones. This configuration is designed to prevent accidental contamination or leakage of hydrocarbons or drilling fluids from reaching usable water- or gas-producing zones within the wellbore.

No Action Alternative

Under the No Action Alternative, drilling and completion of the Federal wells would not take place. Consequently, Federal minerals and associated geologic resources would not be affected.

Invasive and Non-invasive Species

Affected Environment

Vegetation adjacent to the reclaimed RMV 15-35 pad includes an abundance of two non-native annual forbs, kochia (*Bassia* sp.) and Russian-thistle (*Salsola australis*). A non-native annual grass, cheatgrass (*Anisantha tectorum*), is found throughout the project area at moderate density. The area around the proposed RWF 11-35 pad is relatively free of invasive non-native species, with the exception of moderate cover by cheatgrass.

Environmental Consequences

Proposed Action

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

No Action Alternative

Under the No Action Alternative, the Federal wells would not be drilled; however, continued operations and maintenance activities on the pads, including any additional Fee wells drilled under the authority of the COGCC, would present a continuing potential source of weed introductions. Weed control requirements associated with ongoing operations are the same as under the Proposed Action (see Appendix A).

Migratory Birds

Affected Environment

The Migratory Bird Treaty Act (MBTA) includes native passerines (flycatchers and songbirds) as well as birds of prey, migratory waterbirds (waterfowl, wading birds, and shorebirds), and other species such as doves, hummingbirds, swifts, and woodpeckers. Within the context of the MBTA, “migratory” birds include non-migratory “resident” species as well as true migrants, essentially encompassing virtually all native bird species. For most migrant and resident species, nesting habitat is of special importance because it is critical for supporting reproduction in terms of both nesting sites and food. In addition, because birds are generally territorial during the nesting season, their ability to access and utilize

sufficient food is limited by the quality of the territory occupied. During non-breeding seasons, birds are generally non-territorial and able to feed across a larger area and wider range of habitats.

Numerous migratory bird species occupy, or have the potential to occupy, the project area. Migratory bird species that are Federally listed under the Endangered Species Act of 1973, as amended, or classified by the BLM as sensitive species, are addressed under the section on Special Status Species. The current section addresses migratory birds that may inhabit the proposed project area. Emphasizing the need to conserve declining species, the U.S. Fish and Wildlife Service (USFWS) has published a list of 0 Birds of Conservation Concern (BCC) that deserve prompt conservation attention to stabilize or increase populations or to secure threatened habitats. The analysis in this section focuses on BCC species, on non-BCC species that are Neotropical (long-distance) migrants, and on raptors—three groups highly vulnerable to habitat loss or modification on their breeding grounds.

Species on the BCC list that are potentially present in the project area, based on habitat preferences and known geographic ranges, include the flammulated owl (*Otus flammeolus*), pinyon jay (*Gymnorhinus cyanocephalus*), juniper titmouse (*Baeolophus griseus*), gray vireo (*Vireo vicinior*), Brewer's sparrow (*Spizella breweri*), and Cassin's finch (*Carpodacus cassinii*). The Brewer's sparrow is also listed as a BLM sensitive species and therefore addressed in the section on Special Status Species.

Among the BCC species listed above, the pinyon jay, juniper titmouse, and gray vireo are almost totally associated with extensive stands of pinyon pine (*Pinus edulis*) and junipers (Rocky Mountain juniper [*Juniperus scopulorum*] and Utah juniper [*J. utahensis*]). Stands of pinyon-juniper in the project vicinity are suitable for the pinyon jay and juniper titmouse, but the area is farther east than the typical range of the gray vireo, which is not expected. The Brewer's sparrow is typically found in extensive, well-developed stands of sagebrush. The examples of this habitat type within the project vicinity may be too limited is size and homogeneity to support this species, but it should be considered potentially present. Cassin's finch nests in montane and subalpine coniferous forests at higher elevations than those of the project area. However, Cassin's finches may disperse to lower elevations following the breeding season and remain there until the following spring, making this species a likely winter visitor in the area.

Non-BCC species likely to occur in the pinyon-juniper within the project area or venturing into the area from more extensive habitats nearby include Neotropical migrants such as the common nighthawk (*Chordeiles minor*)(not a raptor), common poorwill (*Phalaenoptilus nuttallii*), broad-tailed hummingbird (*Selasphorus platycercus*), black-chinned hummingbird (*Archilochus alexandri*), western kingbird (*Tyrannus verticalis*), Say's phoebe (*Sayornis saya*), gray flycatcher (*Empidonax wrightii*), mountain bluebird (*Sialis currucoides*), western bluebird (*S. mexicana*), plumbeous vireo (*V. plumbeus*), black-throated gray warbler (*Dendroica nigrescens*), and chipping sparrow (*Spizella passerina*).

Sagebrush and sage-grass habitats in the area are suitable primarily for birds that nest on the ground, on low shrubs, or in scattered trees surrounded by more open habitat. Examples include the western kingbird ((*Tyrannus verticalis*), western meadowlark (*Sturnella neglecta*), lark sparrow (*Chondestes grammacus*), and vesper sparrow (*Pooecetes gramineus*). As noted above, sagebrush in the project vicinity does not appear suitable for the Brewer's sparrow, and the same conclusion applies to another shrubland species, the spotted towhee (*Pipilo maculata*). However, both species are potentially present. Also potentially present is the loggerhead shrike (*Lanius ludovicianus*), a predatory songbird that feeds on small mammals, birds, and reptiles as well as insects.

Birds of prey use the project area and surrounding areas for nesting and hunting. Nesting habitat is provided primarily by the pinyon-juniper woodlands. WestWater Engineering, the contractor performing surveys for Williams reported ten species of raptors as potentially occurring in the project area (WWE

2011). Non-BCC raptors most likely to occur, primarily in association with the pinyon-juniper woodland for nesting but also foraging in nearby sagebrush and grassland, include the American kestrel (*Falco sparverius*), sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*A. cooperi*), red-tailed hawk (*Buteo jamaicensis*), and great horned owl (*Bubo virginiana*). The northern harrier (*Circus cyaneus*), a ground-nesting raptor, could potentially nest nearby and is likely to forage, at least occasionally, near the proposed project activities. Besides the flammulated owl, another small owl potentially present in the pinyon-juniper is the northern pygmy-owl (*Glaucidium gnoma*).

One survey was conducted for biological resources including raptors and their nests. The 2011 survey of the access road and existing well pads area found no active nests in the project area. Four known sites from previous surveys by WestWater Engineering (WWE) were re-surveyed to determine their current status; three new nest sites were found during the survey (WWE 2011). All nests were found in the juniper woodlands and scattered narrowleaf cottonwood trees east and south of the RMV 15-35 well pad (WWE 2011). Due to the proximity to open grasslands, agricultural hay fields, private residences, access roads, and a wildland fire in 2007, habitat west of CR 325 did not support any raptor nesting habitat during a recent survey (WWE 2011).

Environmental Consequences

Proposed Action

Direct impacts to migratory birds from the Proposed Action include the loss of approximately 7.8 acres of foraging/hunting habitat and nesting habitat. While habitat loss or fragmentation may affect individual birds, it is not expected to adversely impact a species as a whole. If construction, drilling, or completion activities occur during the spring/summer nesting season, visual and noise disturbance near active nests could cause nest failure or nest abandonment and subsequently, a reduction in productivity. Construction activity during the nesting season could also result in the destruction of clutches and/or mortality of nestlings/fledglings.

The operator remains subject to the MBTA, administered by the USFWS, which precludes the "take" of any raptor or most other native species. The MBTA prohibits the "take" of a protected species. Under the Act, the term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The USFWS interprets "harm" and "kill" to include loss of eggs or nestlings due to abandonment or reduced attentiveness by one or both adults as a result of disturbance by human activity, as well as physical destruction of an occupied nest.

Because raptor nest structures were identified in the project vicinity (WWE 2011), including sites within 0.25 mile of either pad or 0.125 mile of an associated access road or pipeline, a 60-day raptor nesting TL would be applied to the project. Under this TL, the initiation of any construction, drilling, or completion activities during the nesting season (February 15 to August 15) would be subject to a 60-day timing limitation (TL) to prohibit those activities during the period from **March 1 through April 30**. The dates of this TL, to be applied as a COA, were selected based on the most likely nesting raptor being the red-tailed hawk, with the March-April timeframe representing the height of the breeding season.

In addition, a separate 60-day TL to protect non-raptor migratory birds would be applied to prohibit removal of vegetation during the period **May 1 through June 30**. Appendix A provides details of these COAs and potential bases for the granting of an exception to one or both TLs in any given year.

No Action Alternative

The No Action Alternative constitutes denial of the Federal APDs described in the Proposed Action. However, Fee wells drilled under the authority of the COGCC would result in the same potential for impacts to migratory birds as described above for the Proposed Action.

Native American Religious Concerns

Affected Environment

The RMV 15-35 and RWF 11-35 well pads are 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 is currently known in the project area.

Environmental Consequences

Proposed Action

At present, no Native American concerns are known within the project area and none was 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 BLM 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 BLM, 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.

The operator is required to 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). Through the COAs, 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 operator and its contractors would be made aware of the requirements under the NAGPRA.

No Action Alternative

Under the No Action Alternative, the Federal wells proposed and described in the Proposed Action would not be drilled; however, future Fee wells could be drilled under approval from COGCC.

Noise

Affected Environment

Noise is generally described as unwanted sound, weighted and noise intensity (or loudness) is measured as sound pressure in units of decibels (dBAs). The decibel scale is logarithmic, not linear, because the range of sound that can be detected by the human ear is so great that it is convenient to compress the scale to encompass all 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. The project would be located in a rural area with existing oil and gas wells and facilities. Noise levels from human activity in the project vicinity are mostly mechanical, consisting mainly of existing oil and gas wells, new exploration activities, and ranching/farming operations. These noises are widely dispersed throughout the area, with localized impacts from vehicular traffic.

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, compressors, 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 5) at a distance of 350 feet. Periodically, the noise level may increase to 10 dBA above levels in Table 5 for no more than 15 minutes in one hour period. Operations involving pipeline or gas facility installation or maintenance, the use of a drilling rig, completion rig, workover rig, or stimulation is subject to the maximum permissible noise levels for industrial zones.

Table 5. Noise Standards for Light industrial, Residential/Agriculture/Rural

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

Given the remote locations of the proposed project activities and a residence approximately 0.25 mile away, the rural standard is applicable. The allowable noise level for periodic impulsive or shrill noises is reduced by 5 dBA from the levels shown (COGCC 2006).

Short-term (7- to 14-day) increases in nearby noise levels would characterize road and well pad construction while the existing cuttings pit is re-opened. Based on the Inverse Square Law of Noise Propagation (Harris 1991) and an typical noise level for construction sites of 65 dBA at 500 feet (Table 6), project-related noise levels would be approximately 59 dBA at a distance of 1,000 feet, approximating

active commercial areas (EPA 1974). These increased noise levels would be in addition to levels of noise that are already above background levels due to current oil and gas developments in the area.

Table 6. Noise Levels at Typical Construction Sites and along Access Roads

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

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 6, 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. Traffic noise levels would affect residences located along County roads that provide primary access into the area. As stated above, the nearest residence is less than ¼ mile away. While exposure to these noise levels is not likely to be harmful, it is likely to be annoying to residents. Given the close proximity of the house, noise reduction devices may be required if the noise levels greater than 55 dBA are found to impact the resident.

No Action Alternative

The No Action Alternative would constitute denial of the Federal wells as proposed. However, Fee wells drilled under the authority of the COGCC would result in the same potential for impacts to soils as described above for the Proposed Action.

Socio-Economics

Affected Environment

The project area is located within Garfield County, Colorado. The population of Garfield County grew by an average of approximately 3% per year from 2000 to 2005, resulting in an increase from 44,236 to 50,379 residents (DOLA 2010). Population growth in Garfield County is expected to more than double

over the next 20 years from over 50,000 in 2005 to 106,549 in 2025 (DOLA 2010). In the year 2009, industry groups in Garfield County with the highest percentage of total employment were construction 15%, tourism 12%, retail trade 13%, and education and health 20 % (Colorado Department of Labor and Employment 2010). An estimated 13.3% of the population was retired in the year 2000 and did not earn wages (Garfield County 2000). Employment in agriculture, forestry, hunting, and mining accounted for 8% of total employment (Colorado Department of Labor and Employment 2010).

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

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

The growth of the oil and gas industry in the past 10 years has been increasingly important to local economies (BLM 2006). Gas production in Garfield County has increased tremendously during the past nine years from 70,309,038 (MCF) in 2000 to 575,697,025 (MCF) in 2009 (COGCC 2010). In addition, Garfield County is experiencing the fastest oil and gas development in Colorado with over 2,000 drilling permits currently approved between July 2009 and September 2010 (COGCC 2010). While the number of workers employed in the mining and extraction industry in Garfield County has been shown to be only 1.7%, this number is considered misleading because some oil and gas employment has been incorporated as part of the construction sector statistics instead (BLM 2006). For example, in the year 2005, an estimated 4,000 persons were directly employed by gas development companies and their subcontractors in Garfield County (Garfield County 2009).

The Federal government makes “Payments in Lieu of Taxes” (PILT) to County governments to help offset property tax revenue lost of nontaxable Federal lands within County boundaries (BLM 2006). Payments are based on Federal acreage in the County for all land management agencies, including BLM, U.S. Forest Service (USFS), U.S. Fish and Wildlife Service (USFWS), and National Park Service (NPS). The amount may also be adjusted based on population and as appropriated by Congress. By formula, payments are decreased as other Federal funds, such as mineral royalty payments, increase. PILT received by Garfield County in the last five years has been as follows: $808,348 in 2005; $1,065,158 in 2006; $1,078,087 in 2007; and $1,078,521 in 2008; $1,808,984 in 2009 (USDI 2010).

In addition to PILT payments, BLM shares revenue generated by commercial activities on public lands with State and County governments (BLM 2006). Federal mineral royalties are levied on oil and gas production from Federal mineral leases. Oil and gas lessees pay royalties equal to 12.5% of the wellhead value of oil and gas produced from public land. Half the royalty receipts are distributed to Colorado, and the amount distributed to Garfield County in 2002 attributable to oil and gas production was $14.1

million. In 2001, the amount was $5.5 million (BLM 2006). These funds are then allocated to fund County services, schools, and local communities.

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

The NEPA process requires a review of the environmental justice issues as established by Executive Order 12898 (February 11, 1994). The order established that each Federal agency identify any "disproportionately high and adverse human health or environment effects of its programs, policies, and activities on minority and low-income populations." The Latino community is the only minority population of note in the vicinity of the project area. In 2000, 16.7% of the residents of Garfield County identified themselves as Hispanic or Latino, and this is consistent across the State (17.1%). African Americans, American Indians, and Pacific Islanders account for less than 1% of the Garfield County population, which is below the State levels (Garfield County 2000).

Environmental Consequences

Proposed Action

The Proposed Action would have minor positive impacts on the local economies of Garfield County through the creation or retention of job opportunities in the oil and gas industry and in supporting trades and services. In addition, local governments in Garfield County would experience an increase in tax and royalty revenues. Some minor economic loss to private landowners or guides may result from the potential displacement of big game and resulting reduction in big game hunting within the project area.

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

No Action Alternative

The No Action Alternative constitutes a denial of the Federal APDs. However, Fee wells could be drilled under the permits issued by COGCC.

Soils

Affected Environment

The area is located in a valley near Porcupine Creek. The surrounding area is generally level, at elevations between 5,400 and 5,600 feet and with slopes ranging from less than 10% to 15%. The proposed project is covered by the Soil Survey of Rifle Area, Colorado (USDA 1985, NRCS 2010). According to this survey, the pad pipeline and access roads contains the Nihill Channery soil type. The soil is deep, well-drained level to gently sloping soil on alluvial fans and sides of valleys from 5,000 to 6,500 feet. This soil is formed in alluvium derived from Green River shale and sandstone. The uses for this soil are mainly grazing and wildlife habitat. The erosion hazard is moderate.

Environmental Consequences

Proposed Action

The Proposed Action would involve surface disturbance for access to the existing RMV 15-35 and RWF 11-35 pads and the associated access roads and pipelines. The Proposed Action would result in approximately 7.8 acres of short-term vegetation loss and soil compaction and displacement, with a long-term loss of approximately 2.6 acres. In general, the area that would be affected by the Proposed Action contains adequate vegetation buffers and flat slopes that would reduce the potential for sediment transport to Porcupine Creek and Colorado River. However, construction activities would cause mixing of soil horizons, slight to moderate increases in local soil loss, loss of soil productivity, and sediment available for transport to surface waters. Noxious weed infestation resulting from disturbance would impact soil productivity. Potential for such soil loss and transport would increase as a function of slope, feature (pad, road, or pipeline route) to be constructed, and proximity to streams.

Most of the area to be disturbed consists of soils with moderate risk of erosion or slope instability. Throughout the affected area, the potential would also exist for accidental spills or leaks of petroleum products and hazardous materials during construction. These events would cause soil contamination and may decrease the soil fertility and revegetation potential. Long-term soil protection could be achieved by continued maintenance to reduce erosion, remediate soil contamination, and minimizing the size of the pad footprint through interim reclamation. Such impacts should be adequately mitigated by proper utilization of the standard and site-specific COAs.

Following interim reclamation, it would be the responsibility of the operator to continue revegetation/reclamation efforts until vegetation communities on disturbed surfaces are composed of seeded or other desirable vegetation, as determined by the BLM. Appropriate revegetation is important to prevent or minimize soil erosion and infestation of weeds.

No Action Alternative

The No Action Alternative would constitute denial of APDs for Federal wells. However, Fee wells drilled under the COGCC authority would result in impacts similar to those under the Proposed Action.

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

A survey in February 2010 indicated no Federally listed, proposed, or candidate plant species or suitable habitat in the project area. Therefore, the Proposed Action would have "**No Effect**" on these species.

No Action Alternative

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

Federally Listed, Proposed, or Candidate Animal Species

Affected Environment

Eight species of Federally listed, proposed, or candidate threatened or endangered vertebrate species occur within Garfield County or may 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*) –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. The U.S. Forest Service (USFS) has mapped suitable denning, winter, and other habitats for lynx within the White River National Forest (WRNF), portions of which are adjacent to BLM lands within the CRVFO. Mapped suitable habitats in the WRNF comprise several areas known as Lynx Analysis Units (LAUs). Although BLM lands within the CRVFO are generally not suitable habitat, areas adjacent to LAUs may support movement by animals dispersing to a new area or moving to lower elevations during winters in search of prey. However, the project area does not border any LAUs, and this species is therefore not considered further.

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

Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*) – Candidate. This secretive species occurs in mature riparian forests of cottonwoods and other large deciduous trees with a well-developed understory of tall riparian shrubs. Because no known occurrences or suitable habitats are present in the project vicinity, this species is not considered further.

Razorback Sucker (*Xyrauchen texanus*), Colorado Pikeminnow (*Ptychocheilus lucius*), Humpback Chub (*Gila cypha*), and Bonytail (*G. elegans*) – Endangered. These four species of Federally listed big-river fishes occur within the Colorado River drainage basin near or downstream from the project area. Designated Critical Habitat for the razorback sucker and Colorado pikeminnow includes the Colorado River and its 100-year floodplain west (downstream) from the town of Rifle. This portion of the Colorado River lies a few miles north of the project area. The nearest known habitat for the humpback chub and bonytail is within the Colorado River approximately 70 miles downstream from the project area. Occasionally, the bonytail is found in Colorado west of Grand Junction, but its range does not extend eastward from that point. The only known population of humpback chub in Colorado is also west of Grand Junction.

Greenback Cutthroat Trout (*Oncorhynchus clarki stomias*) – Threatened. The greenback cutthroat trout was not identified on the USFWS list for Garfield County; however, recent surveys have identified a

population in Cache Creek, located several drainages east of the project area. Because drainages within the project area do not support this species, it is not considered further.

Environmental Consequences

Proposed Action

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

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

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 apply to the 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 is a very infrequent event due to the various design requirements imposed by BLM and the COGCC. However, in the event of a spill or accidental release, the operator is required to implement its Spill Prevention, Control, and Countermeasure (SPCC) plan, including such cleanup and mitigation measures as required by BLM or the State. For these reasons, and because the potential for spills or other releases in quantities that would be deleterious, or even detectable, upon rapid dilution in the Colorado River, the BLM has made a determination of "**No Effect**" relative to these occurrences.

No Action Alternative

The No Action Alternative would constitute denial of the Federal wells as proposed. However, Fee wells drilled under the authority of the COGCC would result in the same potential for impacts to Federally listed, proposed, or candidate animal species as described above for the Proposed Action.

BLM Sensitive Plant Species

Affected Environment

BLM sensitive plant species with habitat and/or occurrence records in Garfield County include DeBeque milkvetch (*Astragalus debequaeus)*, Naturita milkvetch (*Astragalus naturitensis)*, Piceance bladderpod

(*Lesquerella parviflora*), Roan Cliffs blazing star (*Mentzelia rhizomata*), Harrington's penstemon (*Penstemon harringtonii*), and Cathedral Bluffs meadow-rue (*Thalictrum heliophilum*).

Environmental Consequences

Proposed Action

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

No Action Alternative

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

BLM Sensitive Animal Species

Affected Environment

BLM sensitive animal species with habitat and/or occurrence records in the portion of the CRVFO that includes the project area and vicinity are listed in Table 7.

Table 7. Special Status Wildlife Species Present or Potentially Present in the Project Area

Common Name	***Habitat***	***Potential for Occurrence***
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	Nests and hunts in montane and subalpine conifer or conifer-aspen forests but may use pinyon-juniper in winter.	Unlikely
Bald eagle	Nests and roosts in mature cottonwood forests along rivers, large streams, and lakes.	Present along Colorado River
Brewer's Sparrow	Nests in sagebrush shrublands, typically more extensive stands than in the project area.	Unlikely
Midget faded rattlesnake	Occurs in cold desert areas dominated by sagebrush and with an abundance of rock outcrops and exposed canyon walls, typically farther west than the project area.	Unlikely
Great Basin spadefoot	Breeds in seasonal waters in pinyon-juniper woodlands and semi-desert shrublands, typically farther west than the project.	Unlikely
Northern leopard frog	Breeds in the shallows perennial waters, including lake margins, ponds, or slow-flowing streams; feeds in nearby wet vegetation.	Not present
Colorado River cutthroat trout	Restricted to small headwaters streams isolated from introduction or colonization by non-native trouts.	Not present
Flannelmouth sucker, bluehead sucker, roundtail chub	Flannelmouth sucker and roundtail chub generally restricted to rivers and major tributaries. Bluehead sucker also in smaller streams. No habitat for these species within the project vicinity.	Present in Colorado River

Environmental Consequences

Proposed Action

Fringed Myotis (*Myotis thysanodes* and Townsend's Big-eared Bat (*Corynorhinus townsendii*) – No caves or other suitable roosting sites occur in the project area. Loss of large trees, potentially also used for roosting, would be negligible, as would the associated loss of hunting habitat. Temporary avoidance by bats of areas of nighttime drilling or completion activities would be unlikely to affect population sizes and reproductive success.

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. They 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. However, the amount of habitat loss is such that any impacts on winter goshawks would be negligible at the individual, population, and species levels.

Bald Eagle (*Haliaeetus leucocephalus*) – The bald eagle is no longer Federally listed as threatened or endangered but remains protected by the Bald and Golden Eagle Protection Act (BAGEPA) and the MBTA. The species both nests and roosts in large cottonwoods along the Colorado River and major tributaries within the CRVFO. During most of the year, it hunts along these streams for fish and, secondarily, waterfowl. During winter, when rivers may be less accessible due to ice cover, or during periods of high, fast, and turbid flows during the peak of spring runoff, they may shift their hunting to include upland areas in search of rabbits, ground squirrels, and carrion. The location of the project area in marginal habitats not adjacent to the Colorado River makes the potential for adverse impacts very low.

Brewer's Sparrow (*Spizella breweri*) – This project vicinity contains limited, marginally suitable habitat for the Brewer's sparrow, which generally is restricted to relatively extensive, uniform stands of sagebrush, primarily sagebrush steppe. If the species were to occur, oil and gas activities occurring with the home range of a nesting pair could cause individuals to shift their feeding patterns and to locate their nests to avoid the disturbance (noise, dust, human activity). However, this impact would be limited to the nesting season and would not be an issue for long-term production and maintenance operations. A 60-day TL to protect nesting birds by prohibiting vegetation removal during the period **May 1 through June 30** would also be applied as a COA (Appendix A).

Midget Faded Rattlesnake (*Crotalus viridis concolor*) – The midget faded rattlesnake is a small, pale-colored subspecies of the common and widespread western rattlesnake. The midget faded rattlesnake is endemic to a small area of southwestern Wyoming, northeastern Utah, and northwestern Colorado, including western Garfield County. Suitable habitats include sandy and rocky areas in pinyon-juniper and semi-desert shrub. In the unlikely event that this species were to occur in the project area, the minimal new habitat disturbance would greatly reduce the potential for adverse impacts.

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

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

intermittent streams. This species requires streams with good water quality and abundant aquatic or shoreline vegetation. No suitable habitat would be directly affected by the project

Colorado River Cutthroat Trout (*Oncorhynchus clarki pleuriticus*) – Remaining populations of this subspecies of cutthroat trout occur mostly in headwater streams and lakes of the Colorado River drainage. Because no perennial streams would be affected by the project area, impacts to the Colorado River cutthroat trout are not expected.

Flannelmouth Sucker (*Catostomus latipinnis*), Bluehead Sucker (*C. discobolus*), and Roundtail Chub (*Gila robusta*) – As with the ecologically similar Colorado River endangered fishes described above, the flannelmouth sucker, bluehead sucker, and roundtail chub are adapted to naturally high sediment loads and therefore would not be affected by increased sediment transport to the Colorado River, in the unlikely event that this were to occur as a result of the project. Protective COAs for water quality (Appendix A) would also minimize this potential for flow of chemical pollutants into area streams. Also similarly to the endangered big-river fishes, these species are vulnerable to alterations in flow regimes in the Colorado River that affect the presence of sandbars and seasonally flooded overbank areas needed for reproduction. The small amount of water consumption associated with the Proposed Action would not cause discernible impacts to the Colorado River flow regime.

No Action Alternative

The No Action Alternative would constitute denial of the Federal wells as proposed. However, Fee wells drilled under the authority of the COGCC would result in the same potential for impacts to Federally listed, proposed, or candidate animal species as described above for the Proposed Action.

Vegetation

The RMV 15-35 pad is located in a burned pinyon-juniper woodland. Current vegetation is fairly weedy, with the annual forbs Russian-thistle and kochia and the subshrub broom snakeweed (*Gutierrezia sarothrae*) as the dominant species. Some young juniper have reestablished in the area.

The RWF 11-35 pad lies on the edge of a mature pinyon-juniper woodland with pockets of decadent basin big sagebrush (*Artemisia tridentata* subsp. *tridentata*). Understory vegetation is sparse due to the dense overstory canopy cover.

Environmental Consequences

Proposed Action

Under the Proposed Action, 7.8 of short-term disturbance would occur on Fee land. This disturbance would be reduced to 2.6 acres following successful interim reclamation. With implementation of standard conditions of approval (Appendix A), desirable forbs and grasses on the unused portions of the pad, road, and pipeline could be established within 2 to 3 years. However, because of periodic workovers and the potential for additional well bores in the future, it is likely that vegetation would remain in an early seral stage for the life of the wells.

No Action Alternative

Under this alternative, the Federal wells would not be drilled. Impacts associated with Fee wells approved by the pacts to vegetation would still occur and would be similar to the Proposed Action.

Visual Resources

Affected Environment

The proposed Action would take place on private lands southwest of Rifle. Since the Proposed Action occurs on private land, Federal lease terms regarding visual concerns are not applicable. Visual resource management objectives do not apply to non-BLM lands; visual values for those lands are only protected by landowner discretion. This analysis identifies recommendations to reduce visual impacts.

The project area is bound by the Colorado River to the north, Porcupine Creek to the east, Spruce Creek to the west, and the lower foothills of Houston Mountain to the south. Taughenbaugh Mesa and Flatiron Mesa rise further to the east and Holms Mesa rises further to the west. Vegetation consists of riparian vegetation along the Colorado River; and agricultural fields intermixed with patches of dense juniper and sagebrush flats in the valley floor. The landscape character consists of a mixture of rural agricultural lands, rural residences, and oil and gas development (Figure 5).

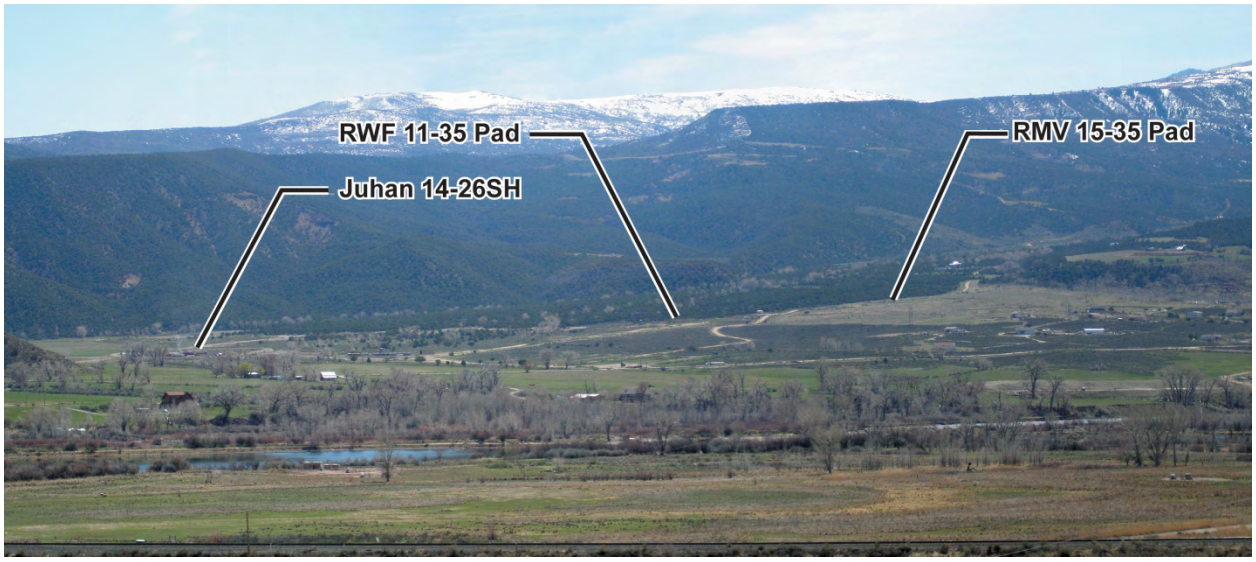


Figure 5. View looking southeast toward the project area from the I-70 Frontage Road (Highway 6/24). This represents a typical view for travelers heading east and west along I-70 between West Rifle and Webster Mesa.

The visual resources analysis area for this EA includes the I-70 frontage Road (State Highway 6/24) from West Rifle to Webster Mesa; County Road 320 (Rifle-Rulison Road) from Holms Mesa to Taughenbaugh Mesa; and County Road 325 (Porcupine Creek Road). The Proposed Action would be located in the viewer's foreground/middle ground, within 5 miles from these locations. BLM guidance states that lands with high visual sensitivity are those within five miles of a primary travel corridor and of moderate to very high visual exposure, where details of vegetation and landform are readily discernible and changes in visual contrast can be easily noticed by the casual observer.

Visual exposure of project components from I-70 would be limited to eastbound and westbound traffic between West Rifle and Webster Mesa. There is small finger of Webster Mesa that extends across the I-70 Corridor from the North to the South. Beyond this location, to the west, views to the project area are obscured by topography.

The Rifle-Rulison Road (CR 320) and Porcupine Creek Road (CR 325) are located in proximity to the project area and would have visual exposure to the Proposed Action. Some private residences are located near the project area, primarily to the northwest and north. Viewers would be looking up toward the Proposed Action or directly at the Proposed Action.

Environmental Consequences

Proposed Action

The planning process involved a site visit to review the proposed pad expansions; pipeline and facility locations. Short-term visual impacts due to pad construction; pipeline installation, drilling and completion activities would occur within the project area. The existing landscape would be changed by the introduction of contrasting elements within the landscape in the form of new lines, colors, forms, and textures. Expanded pads, surface facilities, and pipelines would increase the presence of drilling rigs, heavy equipment (e.g., dozers, graders, etc.), and vehicular traffic with an associated increase in dust, light pollution, and well flaring.

RMV 15-35 Pad

The northwestern and northern portions of the pad would be the most visible to nearby residences. Production equipment will be located in the southwest corner of the pad. This location would be further from view from private residences to the northwest and north. Their angle of view would be inferior and the sloping topography would provide some natural screening. The equipment location would allow for the northern edge, northwestern corner (maximum fill of 17.3 feet) and southeastern corner (maximum cut 17.3 feet) of the pad to be pulled back during the time of interim reclamation, reducing the amount of visible surface disturbance. The pipelines would be buried in the pad and tie into existing gas lines within Porcupine Creek Road; this would reduce any additional surface disturbance. Some form of an earthen berm should be considered along the northwest and west side of the pad to further screen the pad from nearby residences.

Given the surface ownership of the Proposed Action, the standard Best Management Practices (BMPs) related to reclamation, facility paint colors, and screening the pad and pipeline alignments from view would mitigate the visual impacts of the project. Short-term disturbance of the pad and access road would be 5 acres, within the original surface disturbance area. Following interim reclamation, the area of long-term disturbance would be 1.14 acres.

RWF 11-35 Pad

The western and northwestern portions of the pad would be the most visible to nearby residences. The production equipment would be located on the west side of the pad. This pad has the benefit of the existing topography providing some natural screening, but additional screening from the nearby residences should be considered. This could be in the form of an earthen berm along the western edge of the pad. The northern end (maximum fill of 11.9 feet) and southern end (maximum cut of 12.6 feet) of the pad could be pulled back during the time of interim reclamation. The pipelines would be buried within existing disturbance, so no new additional surface disturbance would be required. Given the surface ownership of the Proposed Action, the standard BMPs related to reclamation, facility paint colors, and screening the pad and pipeline alignments from view would mitigate the visual impacts of the project.

The Proposed Action would result in re-disturbing the southern portion of the old pad that is now in interim reclamation and new disturbance south of the original pad. The new disturbance would be

approximately 2.5 acres and the total size would be 3 acres during drilling and completion operations. The long-term disturbance of the pad would be 1.5 acres.

No Action Alternative

Under the No Action Alternative, none of the components of the Proposed Action would be approved. However, visual impacts associated with ongoing production activities and traffic related to the existing wells on the RMV 15-35 and RWF 11-35 pads would continue for the producing life of the wells. In addition, any new Fee wells and associated pad expansion associated with future Fee wells approved under the authority of the COGCC would be likely to have the same types of impacts as those described for the Proposed Action.

Wastes, Hazardous or Solid

Affected Environment

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

- The Oil Pollution Act (Public Law 101-380, August 18, 1990) prohibits discharge of pollutants into waters of the US, which by definition would include any tributary, including any dry wash that eventually connects with the Colorado River.

- The Comprehensive Environmental Response, Compensation, and Liability Act (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. The BLM would have access to regional resources if justified by the nature of an incident.

Environmental Consequences

Proposed Action

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

Surface water or groundwater could be impacted under the Proposed Action. Pollutants that might be released during the operational phase of the project could include condensate, produced water (if the wells in the area produce water) and glycol (carried to the site and used as antifreeze.) While uncommon, an accident could occur which 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 constitute denial of the Federal wells as proposed. However, Fee wells drilled under the authority of the COGCC would result in the same potential for impacts as described above for the Proposed Action.

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

Surface Water

Affected Environment

The existing locations lie within two U.S. Geological Survey (USGS) 6th-code hydrologic unit watershed. The project area where proposed activities for RMV15-35 would occur is within the Colorado River unit, which empties directly into the Colorado River approximately 1 mile North of the project. The proposed activities for RWF 11-35, road access and the pipeline would occur is within Porcupine Creek unit, which empties directly into the Colorado River approximately 1 mile North of the project. According to the *Stream Classifications and Water Quality Standards* (CDPHE, Water Quality Control Commission [WQCC] Regulation No. 37) (CDPHE 2007), Porcupine Creek and the unnamed ephemeral drainages that drain most of the project vicinity are within segment 4a , which includes tributaries to the Colorado River from its confluence with the Roaring Fork River to a point immediately below its confluence with Parachute Creek. Following is a brief description of segment 4a.

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

suitable for primary contact recreation. This segment is, however, suitable or intended to become suitable for potable water supplies and agricultural purposes that include irrigation and livestock use.

All streams within segment number 4a are on the State of Colorado's *303(d) List of Impaired Waters and Monitoring and Evaluation List* (CDPHE, WQCC Regulation No. 93) (CDPHE 2010) for naturally high levels of selenium. *Colorado's Monitoring and Evaluation List* identifies waterbodies where there is reason to suspect water quality problems, but uncertainty also exists regarding one or more factors. The USGS has collected limited surface water quality and flow data at a site along Porcupine Creek near the project area (USGS 2007). Data were also collected from the Colorado River below the project area near Rulison (Table 8).

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

Table 8. Selected Water Quality Data for Two Sampling Locations near the Project Area

Parameter	***Porcupine Creek CO, USGS Site #14010005 08/09/1979***	***Colorado River below Rulison CO, USGS Site #09092570 4/8/1977***
Instantaneous discharge (cfs)	3.4	1560
Temperature, water (°C)	17	11
Field pH (standard units)	8.0	8.1
Specific conductance (µS/cm/cm at 25°C)	130	1200
Total Dissolved Solids (mg/L)	237	733
Hardness as CaCO3 (mg/L)	150	250
Chloride (mg/L)	0.8	230
Selenium (µg/L)	NA	1
Dissolved oxygen (mg/L)	8	10

Note: NA = data not available
Source: USGS 2007.

Environmental Consequences

Proposed Action

The Proposed Action would result in 7.8 acres of surface disturbance, of which approximately 2.6 acres would not be reclaimed during the life of the wells. Potential impacts to surface water associated with the Proposed Action occur from surface-disturbing activities, traffic, waste management, and the use, storage and transportation of fluids (i.e., chemicals, condensate, and produced water). Surface-disturbing activities associated with well and facility pads, roads, and pipelines cause loss of vegetation cover, soil compaction and displacement, increased volume and velocity of runoff, and increased sedimentation and salinity in surface waters. Initially impacts can be minimized by stormwater management, stockpiling topsoil, controlling erosion, rehabilitation of disturbed surfaces quickly. Long-term soil protection could be achieved by continued road and pad maintenance to reduce erosion, remediation of contaminated soils

and minimizing the size of the long-term pad footprint through interim reclamation measures. As proposed, these measures would include limiting cut slope steepness, step-cutting, crowning road surfaces, installing culverts and drainage systems, and applying gravel to all upgraded BLM roads in the project area to a compacted thickness of 6 inches (Appendix A).

Oil and gas waste management practices have the potential to contaminate soils and surface water. Contamination of soils could cause long-term reduction in site productivity resulting in increased erosion and potential sediment and contaminant delivery to nearby waterways during runoff. Use, storage, and transportation of fluids such as produced water, hydraulic fracturing fluids, and condensate have the possibility of spills that could migrate to surface or groundwater. Additionally, 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 management areas must be decontaminated to COGCC standards prior to pit closure.

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

No Action Alternative

The No Action Alternative would constitute denial of the Federal wells as proposed. Fee wells drilled under the authority of the COGCC would result in the same potential for impacts to surface waters as described above for the Proposed Action.

Waters of the U.S.

Affected Environment

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

Environmental Consequences

Proposed Action

No new crossings of Waters of the U.S. are included in the Proposed Action, nor is pad expansion and new construction proposed that could discharge fill into Waters of the U.S. The existing road, pipeline, and surface frac line cross Porcupine Creek but no additional fill or disturbance at these crossings would require a USACE 404 permit.

Improperly designed crossings of small ephemeral drainages, in particular any undersized or poorly aligned culverts, could result in soil degradation, including erosion at culvert outlets. This could potentially supply sediment to the Colorado River approximately 1 mile to the North. However, standard and site-specific surface-use COAs listed in Appendix A would be implemented to protect Porcupine

Creek, the Colorado River, and any other Waters of the U.S. potentially impacted by long-distance stormflow transport.

No Action Alternative

The No Action Alternative would constitute denial of the Federal wells as proposed. However, Fee wells drilled under the authority of the COGCC would result in the same potential for impacts to Waters of the U.S. as described above for the Proposed Action.

Groundwater

Affected Environment

The project area is in the lower Piceance Basin aquifer system. The Piceance Basin contains both alluvial and bedrock aquifers. Unconsolidated alluvial aquifers are the most productive aquifers in the Piceance Basin. The groundwater exists in shallow, unconsolidated alluvium associated with the Colorado River (BLM 2006) and 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 water levels range from 50 to 100 feet. The quality of alluvial groundwater in the Colorado River Basin 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.

Groundwater is recharged from snowmelt in upland areas that receive more precipitation than lower altitude areas. In the Piceance Basin, recharge flows from areas near the margins of the basin to discharge areas near principal stream valleys. The groundwater moves laterally and/or upward discharging directly into streams, springs, and seeps by upward movement through confining layers and into overlying aquifers or by withdrawal from wells (USGS 2007). The natural discharge areas generally are found along the Colorado River and its tributaries (USGS 2007).

According to the Colorado Division of Water Resources (DWR), eight fresh-water wells are located within a 0.5- mile radius of the proposed activities. Seven of the eight wells are located between 1,200 and 2,400 feet northwest of the existing well pads. DWR lists these wells as domestic use, with depths ranging from 120 to 215 feet, static water levels between 150 and 172 feet and pump rates averaging 10 gpm. The eighth well is located approximately 2,400 to the southeast, has a depth of 160 feet, a static water level of 85 feet and a discharge rate of 1 gpm.

Environmental Consequences

Proposed Action

Potential impacts to groundwater resources from the Proposed Action would include contamination of the groundwater with produced water, drilling mud, and petroleum constituents. Hydraulic fracturing (fracing) would be incorporated to complete the wells, which would include produced and freshwater mixed with proppants, or propping agents, to stimulate the formation to create fractures that would allow gas to travel more freely from the rock pores where the gas is trapped. Hydrofracturing would be conducted at 5,000 feet or more below ground surface, making it unlikely to cause impacts to groundwater resources near the surface, such as springs or shallow alluvium. However, isolation of any water bearing zones during installation of the production casing would minimize the effects, as well as cementing the production casing to 200 feet above the top of the Mesaverde Group. It is unlikely that any

deep 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 from migrating to potable water zones.

No Action Alternative

Wildlife, Aquatic

Affected Environment

Porcupine Creek is the primary habitat for aquatic wildlife in the project vicinity, although various springs and seeps capable of supporting aquatic wildlife also occur. Porcupine Creek is ephemeral and does not support fish species. The Colorado River, approximately 1 mile north of the project area, supports a variety of native and non-native fish species and aquatic macroinvertebrates.

Environmental Consequences

Proposed Action

Impacts to aquatic wildlife in Porcupine Creek are not expected given the ephemeral nature of the stream. The Colorado may experience a localized increase in sediment during extreme precipitation events. The small increase in sediment anticipated to ultimately reach the Colorado River due to this project should have minimal impact on aquatic wildlife because it would likely be within normal background levels.

No Action Alternative

The impact to aquatic wildlife from the No Action Alternative would be negligible, given the scale of development and required use of best management practices and conditions of approval (see Special Status Species section). No new aquatic habitat would be created and no improvements to existing habitat would occur under this alternative.

Wildlife, Terrestrial

Affected Environment

Mammals

The site is located within winter range and severe winter range for mule deer (*Odocoileus hemionus*) as mapped by the Colorado Division of Wildlife (CDOW 2008). Winter range is that part of the overall range of a species where 90% of the individuals are located during the average five winters out of ten from the first heavy snowfall to spring green-up, or during a site-specific period of winter as defined for each data analysis unit (DAU) (CDOW 2008). Severe winter range is that part of the range of a species where 90 percent of the individuals are located when the annual snowpack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten (CDOW 2006). Field surveys indicate that the project area is occupied winter range for elk and that mule deer occupy the area year-round.

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

(*Mephitis mephitis*) is common in similar habitats in the project vicinity. Less likely but potentially present are the spotted skunk (*Spilogale gracilis*) and ringtail (*Bassariscus astutus*).

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

Birds

Raptors potentially nesting in the large junipers throughout the project vicinity include two small resident hawk species (sharp-shinned and Cooper's hawks) and, where the trees are sufficiently tall for nesting, two larger resident raptors (red-tailed hawk and great horned owl) and a small migratory falcon (American kestrel). Other birds of prey potentially present include a resident ground-nesting hawk (northern harrier) and two small owls, the migratory flammulated owl (a BCC species) and the resident northern pygmy-owl.

Other residents or short-distance migrants in the project vicinity include the northern flicker (*Colaptes auratus*), common raven (*Corvus corax*), black-billed magpie (*Pica hudsonia*), mountain and black-capped chickadees (*Poecile gambeli, P. atricapillus*), American robin (*Turdus migratorius*), Townsend's solitaire (*Myadestes townsendi*), blue-gray gnatcatcher (*Polioptila 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 general area provides potentially suitable habitat for two amphibians in addition to those addressed in the section on Special Status Species. The additional amphibians are the Woodhouse's toad (*Bufo woodhousii*), and western chorus frog (*Pseudacris triseriata*). The toad breeds in suitable, generally seasonal habitats such as ephemeral streams that do not support predatory fish and contain pools of water for a period of at least a few weeks every spring. The chorus frog occurs primarily in cattail and bulrush wetlands and along the vegetated margins of seasonal or perennial ponds and slow-flowing streams. Some existing stock ponds and slow-flowing portions of the drainages are potentially suitable for the northern leopard frog, although none has been documented.

Environmental Consequences

Proposed Action

The Proposed Action would result in the initial loss of 7.8 acres of wildlife habitat. Following partial reclamation of new well pads and roads, long-term forage disturbance would be reduced to approximately 2.6 acres for the Proposed Action. Reclamation activities would benefit some wildlife species by increasing herbaceous forage. In areas where shrubs and trees would be disturbed, impacts to wildlife from loss of thermal and/or hiding cover would be long-term, lasting the 20 to 30+ years following

reclamation that it would take for these woody species to re-establish. Surface disturbing activities within these habitats during the winter and during migratory seasons have the potential to displace mule deer and elk from these important habitats.

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

Indirect impacts on wildlife, especially big game and raptors, would be the disturbance caused by increased human activity, equipment operation, vehicle traffic, harassment by any dogs brought to the site by contractors, and noise related to drilling and completion activities. Most species of wildlife are relatively secretive and distance themselves from these types of disturbance or move to different areas screened by vegetation screening or topographic features. This avoidance, referred to as displacement, results in underuse of habitat near the disturbance. Avoidance of forage and cover resources adjacent to disturbance reduces habitat utility and the capacity of the affected acreage to support wildlife populations (BLM 1999a).

The two pads are located on private land overlying a Federal lease with no big game winter range TL. However, a 60-day TL would be attached as a COA to prohibit initiation of construction, drilling, or completion activities during the period **January 1 to February 28/29.** Additional TLs include a 60-day prohibition against the initiation of construction, drilling, and completion activities during the period **March 1 to April 30** to protect nesting by raptors and a separate 60-day TL to prohibit vegetation removal during the period **May 1 through June 30** to protect nesting by migratory birds. These COAs are described in Appendix A.

No Action Alternative

The No Action Alternative would constitute denial of the Federal wells as proposed. Fee wells drilled under the authority of the COGCC would result in the same potential for impacts to wildlife as described above for the Proposed Action.

SUMMARY OF CUMULATIVE IMPACTS

The *Glenwood Springs Oil & Gas Leasing & Development Final Supplemental EIS* (FSEIS) (BLM 1999) analyzed three alternatives for oil and gas development in the Glenwood Springs Resource Area (GSRA). The assessment included an analysis of impacts of past, present, and reasonably foreseeable future actions, including predicted future oil and gas development, on public and private lands. Since the FSEIS presents the most current analysis of cumulative impacts in the CRVFO, it is incorporated by reference.

Until relatively recently, modifications of the region have been characteristic of agricultural and ranching lands, with localized industrial impacts associated with the railroad and I-70 highway corridors. More recently, these changes are cumulative to the growth of residential and commercial uses, utility corridors, oil and gas developments, and other rural industrial uses. These increasing activity levels have accelerated the accumulation of impacts in the area. These impacts have included: (1) direct habitat losses; (2) habitat fragmentation and losses in habitat effectiveness; (3) elevated potential for runoff, erosion, and sedimentation; (4) expansion of noxious weeds and other invasive species; and (5) increased noise and traffic and reductions in the scenic quality of the area (BLM 1999: 4-1 to 4-68).

None of the cumulative impacts described in the FSEIS was characterized as significant, and new technologies and regulatory requirements have reduced the impacts of some land uses. Nonetheless, it is clear that past, present, and reasonably foreseeable future actions has had and would continue to have adverse affects on various elements of the human environment. The anticipated impact levels for existing and future actions range from negligible to locally major, and primarily negative, for specific resources. The primary reasons for this assessment are twofold: (1) the rate of development, particularly oil and gas development, is increasing in the area, resulting in an accelerated accumulation of individually nominal effects; and (2) the majority of residential and commercial expansion, as well as oil and gas development, have occurred, and is likely to continue to occur, on private holdings where mitigation measures designed to protect and conserve resources are not in effect.

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

PERSONS AND AGENCIES CONSULTED

Williams Production RMT Company – April Mestas, Mike Shoemaker, Jason Raley
WestWater Engineering – Van Graham
Colorado Division of Wildlife – Michael Warren
Colorado Oil & Gas Conservation Commission – Dave Kuebzco

INTERDISCIPLINARY REVIEW

Table 9 lists 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 the Proposed Action, and identification of appropriate COAs to be attached and enforced by BLM.

Table 9. BLM Interdisciplinary Team Authors and Reviewers

Name	***Title***	***Areas of Participation***
Allen Crockett, Ph.D.	Supervisory Natural Resource Specialist	NEPA Review
Beth Brenneman	Ecologist	Invasive Non-native Species, Special Status Plants, Vegetation
John Brogan	Archaeologist	Cultural Resources, Native American Religious Concerns
Julie McGrew	Natural Resource Specialist	Visual Resources
Rebecca Rutan	Natural Resource Specialist	Team Leader, Access and Transportation, Noise, Solid and Hazardous Wastes, Socio-Economics, Aquatic Wildlife
Shauna Kocman, Ph.D.	Hydrologist	Air Quality, Noise, Soils, Surface Water, Waters of the U.S.
Sylvia Ringer	Wildlife Biologist	Migratory Birds, Special Status Species, Aquatic and Terrestrial Wildlife
Todd Sieber	Geologist	Geology and Paleontology, Groundwater
Will Howell	Petroleum Engineer	Downhole COAs

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The environmental assessment (EA) analyzing the environmental effects of the Proposed Action has been reviewed. The project design and approved mitigation measures associated with the RMV 15-35 well pad result in a Finding of No Significant Impact on the human environment. An impact analysis relative to the RWF 11-35 well pad cannot be completed until submittal by the proponent of certain missing information identified in the EA. An environmental impact statement (EIS) is not necessary to further analyze the environmental effects of the portion of the Proposed Action relating to the RMV 15-35 pad.

DECISION RECORD

DECISION: It is my decision to approve the Proposed Action and mitigation measures described in this EA in relation to the RMV 15-35 well pad and associated facilities. It is also my decision to defer approval of the Proposed Action and mitigation measures in relation to the RWF 11-35 well pad pending submittal by the proponent of exact surface locations for the six Federal oil and gas wells proposed for that pad and completion by the BLM of appropriate downhole Conditions of Approval (COAs) for those wells. This decision will provide for the orderly, economical, and environmentally sound exploration and development of oil and gas resources on valid oil and gas leases.

RATIONALE: The bases for this decision are as follows:

1. Approval of the Proposed Action is validating the rights granted with the Federal oil and gas leases to develop the leasehold to provide commercial commodities of oil and gas.

2. The environmental impacts have been mitigated with measures included in the attached COAs.

3. This Decision does not authorize the drilling of any Federal oil and gas wells or the initiation of surface-disturbing activities on any Federal surface lands. Those authorizations are limited to approval by the BLM of Applications for Permits (APDs) for the individual Federal wells.

4. The BLM will prepare an amended Decision Record upon submittal by the proponent of information identified in the EA as "To Be Determined" and completion by the BLM of appropriate downhole COAs for Federal oil and gas wells on the deferred pad.

MITIGATION MEASURES: Mitigation measures are presented in Appendix A.

NAME OF PREPARER: Rebecca Rutan, Natural Resource Specialist

SIGNATURE OF AUTHORIZED OFFICIAL:

Supervisory Natural Resource Specialist

DATE SIGNED: June 6, 2011

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APPENDIX A

SURFACE-USE AND DOWNHOLE CONDITIONS OF APPROVAL

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STANDARD SURFACE-USE CONDITIONS OF APPROVAL

The following standard surface use COAs are in addition to all stipulations attached to the respective Federal leases and to any site-specific COAs for individual well pads.

1. Administrative Notification. The operator shall notify the BLM representative at least 48 hours prior to initiation of construction. If requested by the BLM representative, the operator shall schedule a pre-construction meeting, including key operator and contractor personnel, to ensure that any unresolved issues are fully addressed prior to initiation of surface-disturbing activities or placement of production facilities.

2. Road Construction and Maintenance. Roads shall be crowned, ditched, surfaced, drained with culverts and/or water dips, and constructed to BLM Gold Book standards. Initial gravel application shall be a minimum of 6 inches. The operator shall provide timely year-round road maintenance and cleanup on the access roads. A regular schedule for maintenance shall include, but not be limited to, blading, ditch and culvert cleaning, road surface replacement, and dust abatement. When rutting within the traveled way becomes greater than 6 inches, blading and/or gravelling shall be conducted as approved by the BLM.

3. Dust Abatement. The operator shall implement dust abatement measures as needed to prevent fugitive dust from vehicular traffic, equipment operations, or wind events. The BLM may direct the operator to change the level and type of treatment (watering or application of various dust agents, surfactants, and road surfacing material) if dust abatement measures are observed to be insufficient to prevent fugitive dust.

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

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

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

5. Jurisdictional Waters of the U.S. The operator shall obtain appropriate permits from the U.S. Army Corps of Engineers (USACE) prior to discharging fill material into Waters of the U.S. in accordance with Section 404 of the Clean Water Act. Waters of the U.S. are defined in 33 CFR Section 328.3 and may include wetlands as well as perennial, intermittent, and ephemeral streams. Permanent impacts to Waters of the U.S. may require mitigation. Contact the USACE Colorado West

Regulatory Branch at 970-243-1199 ext. 17 (Travis Morse). Copies of any printed or emailed approved USACE permits or verification letters shall be forwarded to the BLM.

6. Wetlands and Riparian Zones. The operator shall restore temporarily disturbed wetlands or riparian areas. The operator shall consult with the BLM Colorado River Valley Field Office to determine appropriate mitigation, including verification of native plant species to be used in restoration.

7. Reclamation. The goals, objectives, timelines, measures, and monitoring methods for final reclamation of oil and gas disturbances are described in Appendix I (Surface Reclamation) of the 1998 Draft Supplemental EIS (DSEIS). Specific measures to follow during interim and temporary (pre-interim) reclamation are described below.

   a. Reclamation Plans. In areas that have low reclamation potential or are especially challenging to restore, reclamation plans will be required prior to APD approval. The plan shall contain the following components: detailed reclamation plats, which include contours and indicate irregular rather than smooth contours as appropriate for visual and ecological benefit; timeline for drilling completion, interim reclamation earthwork, and seeding; soil test results and/or a soil profile description; amendments to be used; soil treatment techniques such as roughening, pocking, and terracing; erosion control techniques such as hydromulch, blankets/matting, and wattles; and visual mitigations if in a sensitive VRM area.

   b. Deadline for Interim Reclamation Earthwork and Seeding. Interim reclamation to reduce a well pad to the maximum size needed for production, including earthwork and seeding of the interim reclaimed areas, shall be completed within 6 months following completion of the last well planned to be drilled on that pad as part of a continuous operation. If a period of greater than one year is expected to occur between drilling episodes, BLM may require implementation of all or part of the interim reclamation program.

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

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

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

   c. Topsoil Stripping, Storage, and Replacement. *All* topsoil shall be stripped following removal of vegetation during construction of well pads, pipelines, roads, or other surface facilities. In areas

of thin soil, a minimum of the upper 6 inches of surficial material shall be stripped. The BLM may specify a stripping depth during the onsite visit or based on subsequent information regarding soil thickness and suitability. The stripped topsoil shall be stored separately from subsoil or other excavated material and replaced prior to final seedbed preparation. The BLM best management practice (BMP) for the Windrowing of Topsoil (COA number 19) shall be implemented for well pad construction whenever topography allows.

d. Seedbed Preparation. For cut-and-fill slopes, initial seedbed preparation shall consist of backfilling and recontouring to achieve the configuration specified in the reclamation plan. For compacted areas, initial seedbed preparation shall include ripping to a minimum depth of 18 inches, with a maximum furrow spacing of 2 feet. Where practicable, ripping shall be conducted in two passes at perpendicular directions. Following final contouring, the backfilled or ripped surfaces shall be covered evenly with topsoil.

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

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

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

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

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

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

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

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

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

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

h. Erosion Control. Cut-and-fill slopes shall be protected against erosion with the use of water bars, lateral furrows, or other measures approved by the BLM. Cut-and-fill slopes along drainages or in areas with high erosion potential shall also be protected from erosion using hydromulch designed specifically for erosion control or biodegradable blankets/matting, bales, or wattles of weed-free straw or weed-free native grass hay. A well-anchored fabric silt fence shall also be placed at the toe of cut-and-fill slopes along drainages or to protect other sensitive areas from deposition of soils eroded off the slopes. Additional BMPs shall be employed as necessary to reduce soil erosion and offsite transport of sediments.

i. Site Protection. The pad shall be fenced to BLM standards to exclude livestock grazing for the first two growing seasons or until seeded species are firmly established, whichever comes later. The seeded species will be considered firmly established when at least 50 percent of the new plants are producing seed. The BLM will approve the type of fencing.

j. Monitoring. The operator shall conduct annual monitoring surveys of all sites categorized as "operator reclamation in progress" and shall submit an annual monitoring report of these sites to the BLM by **December 31** of each year. The monitoring program shall use the four Reclamation Categories defined in Appendix I of the 1998 DSEIS to assess progress toward reclamation objectives. The annual report shall document whether attainment of reclamation objectives appears likely. If one or more objectives appear unlikely to be achieved, the report shall identify appropriate corrective actions. Upon review and approval of the report by the BLM, the operator shall be responsible for implementing the corrective actions or other measures specified by the BLM.

8. Weed Control. The operator shall regularly monitor and promptly control noxious weeds or other undesirable plant species as set forth in the Glenwood Springs Field Office *Noxious and Invasive Weed Management Plan for Oil and Gas Operators*, dated March 2007. A Pesticide Use Proposal (PUP) must be approved by the BLM prior to the use of herbicides. Annual weed monitoring reports shall be submitted to BLM by **December 1**.

9. Big Game Winter Range Timing Limitation. To minimize impacts to wintering big game, no construction, drilling or completion activities shall occur during a Timing Limitation (TL) period from **January 1 to March 1 annually**.

10. Bald and Golden Eagles. It shall be the responsibility of the operator to comply with the Bald and Golden Eagle Protection Act (Eagle Act) with respect to "take" of either eagle species. Under the Eagle Act, "take" includes to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest and disturb. "Disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior. Avoidance of eagle nest sites, particularly during the nesting season, is the primary and preferred method to avoid a take. Any oil or gas construction, drilling, or completion activities planned within 0.5 mile of a bald or golden eagle nest, or other associated activities greater than 0.5

miles from a nest that may disturb eagles, should be coordinated with the BLM project lead and BLM wildlife biologist and the USFWS representative in the BLM Field Office (970-876-9051).

11. Raptor Nesting. Raptor nest surveys in the project vicinity resulted in the location of raptor sticknest structures within 0.25 mile of a well pad or 0.125 mile of an access road, pipeline, or other surface facility. To protect nesting raptors, a 60-day Timing Limitation (TL) shall be applied to prohibit the initiation of construction, drilling, or completion activities within the buffer widths specified above during the period **March 1 to April 30**. An exception to this TL may be granted for any subsequent survey if a nesting survey determines that no new nests have been constructed within the specified buffer widths.

12. Migratory Birds. It shall be the responsibility of the operator to comply with the Migratory Bird Treaty Act (MBTA) with respect to "take" of migratory bird species. Under the MBTA, "take" means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The operator shall prevent use by migratory birds of any pit containing fluids associated with oil or gas operations, including but not limited to reserve pits, produced-water pits, hydraulic fracturing flowback pits, cuttings trenches (if covered by water or other fluid), and evaporation pits. Liquids in these pits may pose a risk to migratory birds (e.g., waterfowl, shorebirds, wading birds, songbirds, and raptors) as a result of ingestion, absorption through the skin, or interference with buoyancy and temperature regulation. Regardless of the method used, it shall be in place within 24 hours following the placement of fluids into a pit. Because of high toxicity to birds, oil slicks and oil sheens should immediately be skimmed off the surface of any pit that is not netted. The most effective way to eliminate risk to migratory birds is prompt drainage, closure, and reclamation of pits, which is strongly encouraged. All mortality or injury to species protected by the MBTA shall be reported immediately to the BLM project lead and to the USFWS representative in the BLM Field Office at 970-876-9051 (Creed Clayton) and visit http://www.fws.gov/mountain-prairie/contaminants/oilpits.htm.

13. Birds of Conservation Concern. Pursuant to BLM Instruction Memorandum 2008-050, all surface-disturbing activities are prohibited from **May 1 to June 30** to reduce impacts to Birds of Conservation Concern (BCC). An exception to this COA 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.

14. Range Management. Range improvements (fences, gates, reservoirs, pipelines, etc) shall be avoided during development of natural gas resources to the maximum extent possible. If range improvements are damaged during exploration and development, the operator will be responsible for repairing or replacing the damaged range improvements. If a new or improved access road bisects an existing livestock fence, steel frame gate(s) or a cattleguard with associated bypass gate shall be installed across the roadway to control grazing livestock.

15. *Ips* Beetle. To avoid mortality of pinyon pines due to infestations of the *Ips* beetle, any pinyon trees damaged during road, pad, or pipeline construction shall be chipped after being severed from the

stump or grubbed from the ground, buried in the toe of fill slopes (if feasible), or cut and removed from the site within 24 hours to a location approved by the Colorado State Forest Service.

16. Paleontological Resources. All persons associated with operations under this authorization shall be informed that any objects or sites of paleontological or scientific value, such as vertebrate or scientifically important invertebrate fossils, shall not be damaged, destroyed, removed, moved, or disturbed. If in connection with operations under this authorization any of the above resources are encountered the operator shall immediately suspend all activities in the immediate vicinity of the discovery that might further disturb such materials and notify the BLM of the findings. The discovery must be protected until notified to proceed by the BLM.

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

17. Cultural Education/Discovery. All persons in the area who are associated with this project shall be informed that if anyone is found disturbing historic, archaeological, or scientific resources, including collecting artifacts, the person or persons will be subject to prosecution. Pursuant to 43 CFR 10.4(g), the BLM shall be notified by telephone, with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4 (c) and (d), activities shall stop in the vicinity of the discovery, and the discovery shall be protected for 30 days or until notified by the BLM to proceed.

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

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

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

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

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

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

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

    Production facilities shall be placed to avoid or minimize visibility from travel corridors, residential areas, and other sensitive observation points—unless directed otherwise by the BLM due to other resource concerns—and shall be placed as indicated on the plats attached to the APD, unless an alternative placement is approved by BLM.

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

    Above-ground facilities shall be painted a natural color selected to minimize contrast with adjacent vegetation or rock outcrops. The color shall be **Shale Green** unless otherwise authorized on the APD.

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

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

21. Soils. Cuts and fills shall be minimized when working on erosive soils and slopes in excess of 30 percent. Cut-and-fill slopes shall be stabilized through revegetation practices with an approved seed mix shortly following construction activities to minimize the potential for slope failures and excessive erosion. Fill slopes adjacent to drainages shall be protected with well-anchored silt fences, straw wattles, or other acceptable BMPs designed to minimize the potential for sediment transport. On slopes greater than 50 percent, BLM personnel may request a professional geotechnical analysis prior to construction.

DOWNHOLE CONDITIONS OF APPROVAL
Applications for Permit to Drill

Company/Operator: Williams Production RMT Company

Surface Location: SWNW, Section 35, Township 6 South, Range 94 West, 6th P.M.

Well Name and No.	Well Pad	Bottomhole Location	Lease/Unit
RWF 12-35	RMV15-35	SWNW, Sec 35, T6S, R94W	COC07506/128379
RWF 22-35	RMV15-35	SWNW, Sec 35, T6S, R94W	COC07506/128379
RWF 23-35	RMV15-35	NESW, Sec 35, T6S, R94W	COC07506/128379
RWF 312-35	RMV15-35	SWNW, Sec 35, T6S, R94W	COC07506/128379
RWF 412-35	RMV15-35	SWNW, Sec 35, T7S, R95W	COC07506/128379
RWF 323-35	RMV15-35	NESW, Sec 35, T7S, R95W	COC07506/128379
RWF 422-35	RMV15-35	SENW, Sec 35, T7S, R95W	COC07506/128379
RWF 522-35	RMV15-35	SENW, Sec 35, T7S, R95W	COC07506/128379

1. Twenty-four hours *prior* to (a) spudding, (b) conducting BOPE tests, (c) cementing/running casing strings, and (d) within twenty-four hours *after* spudding, the CRVFO shall be notified. One of the following CRVFO's 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; and Alan White, PET.

2. A CRVFO petroleum engineer shall be contacted for a verbal approval prior to commencing remedial work, plugging operations on newly drilled boreholes, changes within the drilling plan, sidetracks, changes or variances to the BOPE, deviating from conditions of approval, and conducting other operations not specified within the APD. Contact Will Howell at 970-876-9049 (office) or 970-319-5837(cell) for verbal approvals.

3. If a well control issue (e.g. kick, blowout, water flow, casing failure, or a bradenhead pressure increase) arises during drilling or completions operations, Will Howell 970-876-9049 (office), 970-319-5837 (cell) shall be notified within 24 hours from the time of the event. IADC/Driller's Logs and Pason Logs (mud logs) will be forwarded to CRVFO, Will Howell, 2300 River Frontage Road, Silt, CO 81652 within 24 hours of a well control event.

4. The BOPE shall be tested and conform to Onshore Order #2 for a **3M** system and recorded in the IADC/Driller's log. A casing head rated to 3,000 psi or greater shall be utilized.

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

9. As a minimum, cement shall be brought to 200 feet above the Mesaverde. After WOC for the production casing, a CBL shall be run to verify the TOC and an electronic copy in .las and .pdf format will be submitted to CRVFO, Will Howell, 2300 River Frontage Road, Silt, CO 81652 within 48 hours. If the TOC is lower than required or the cement sheath of poor quality, a CRVFO petroleum engineer shall be notified for remedial operations within 48 hours from running the CBL and prior to commencing fracturing operations.

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

10. On the first well drilled on this pad, a triple combo open-hole log shall be run from the base of the surface borehole to surface, and from TD to bottom of surface casing shoe. This log shall be in submitted within 48 hours in .las and .pdf format to CRVFO, Will Howell/Todd Sieber, 2300 River Frontage Road, Silt, CO 81652. Contact Todd Sieber at 970-876-9063 (office) or asieber@blm.gov for clarification.

11. 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. Contact Will Howell for clarification.

12. Prior to commencing fracturing operations, the production casing shall be tested to the maximum anticipated surface treating/fracture pressure and held for 15 minutes without a 2% leak-off. If leak-off is found, Will Howell shall be notified within 24 hours of the failed test, but prior to proceeding with fracturing operations. The test shall be charted and set to a time increment as to take up no less than a quarter of the chart per test. The chart shall be submitted within 48 hours after Frac operations.

13. Submit a monthly report of operations or production per CFR 3162.4-3 including any production from these wells in MCFPD, BOPD, BWPD with FTP/SITP until the completion report (Form 3160-4) is filed.

14. Per CFR 3162.4-1(c), not later than the 5th business day after any well begins production on which royalty is due anywhere on a lease site or allocated to a lease site, or resumes production in a case of a well which has been off production for more than 90 days, the operator shall notify the authorized officer by letter or sundry notice, Form 3160-5, or orally to be followed by a letter or sundry notice, of the date on which such production has begun or resumed.