

**U.S. Department of the Interior
Bureau of Land Management
Glenwood Springs Energy Office
2425 South Grand Avenue, Suite 101
Glenwood Springs, Colorado 81601**

ENVIRONMENTAL ASSESSMENT

NUMBER: DOI-BLM-CO-N040-2009-0063EA

CASEFILE NUMBER: Federal Lease COC2799

PROJECT NAME: Proposal to Drill Two Federal Wells on Existing Fee Pad RMV 120-27.

LOCATION: Township 6 South (T. 6S.), Range 94 West (R. 94W.), Section 27, SW¹/₄NE¹/₄, Sixth Principal Meridian, Garfield County, Colorado (Figure 1).

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		
<i>Proposed Wells</i>	<i>Surface Locations</i>	<i>Bottomhole Locations</i>
RWF 32-27	SWNE Sec. 27 T6S R94W 1758 ft. FNL 2200 ft. FEL	SWNE Sec. 27 T6S R94W 2140 ft.FNL 1981 ft. FEL
RWF 432-27	SWNE Sec. 27 T6S R94W 1765 ft. FNL 2204 ft. FEL	SWNE Sec. 27 T6S R94W 2539 ft. FNL 1931 ft. FEL

APPLICANT: Williams Production Company RMT Company (“Williams”).

DESCRIPTION OF THE PROPOSED ACTION AND NO ACTION ALTERNATIVE

Proposed Action

The proposed action is to drill and develop two Federal oil and gas wells (RWF 32-27 and RWF 432-27) from existing well pad RMV 120-27. The well pad is located on private surface and is underlain by private mineral estate. The two Federal wells would be directionally drilled into Federal Lease COC2799. In addition, four fee wells (RWF 341-27, RWF 42-27, RWF 342-27, and RWF 442-27) would be drilled from the RMV 120-27 pad. The constructed pad, access road, and production area would be approximately 1.5 acres. The proposed pad is 160 feet by 300 feet and located primarily within a previously disturbed area, with approximately 0.30 acre of new disturbance. The pad would be reduced to approximately 0.52 acre after interim reclamation.

The proposed project area is located 5 miles southwest of Rifle, Colorado and adjacent to the Colorado River. The area is accessed by existing Interstate 70 (I-70) at the West Rifle exit and proceeding west approximately 1.3 miles along the frontage road to an unmarked private gravel road. The gravel road travels approximately 0.5 mile in a generally southerly direction to the pad location. A locked gate at the private property controls access to the pad.



Figure 1. Project Location.

A rerouted road would access the northeastern corner of the pad, with disturbance to be approximately 0.04 acre. These existing roads would be maintained to an appropriate standard no higher than necessary to accommodate their intended functions, as described in the *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development* (BLM and USFS 2006b) and BLM Handbook H-9113-1 *Roads Manual* or as determined by the private land owner.

The proposed action would include drilling and completion operations; production of natural gas and associated condensate; use of pipelines to convey fluids; and intermediate and final reclamation measures. Production equipment (wellheads, fluid separators, tanks, metering equipment, remote monitoring equipment, combustion unit, produced water pump, etc.) would be installed adjacent to the southwest corner of the pad, with a finished area of 35 feet by 120 feet (Figure 2).

The proposed action would be implemented consistent with Federal oil and gas leases COC2799, Federal regulations (43 CFR 3100), and the operational measures included in the Applications for Permit to Drill (APDs) or attached to the APDs as Conditions of Approval (COAs). The COAs to be applied to this project are presented in Appendices A and B.

No Action Alternative

Under the no action alternative, the four fee wells described above would be drilled from the existing pad on private surface into private mineral estate. Therefore, no Federal approvals would be required. The pad would still be expanded to accommodate the new fee wells, although the amount of expansion would be slightly less. Since two of the six proposed wells would not be drilled under the no action alternative, the drilling, completion, and production phases would involve approximately 33% decrease in activity and vehicular traffic compared to the proposed action.

PURPOSE AND NEED FOR THE ACTION

The purpose of the action is to develop oil and gas resources on Federal Lease COC2799 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.

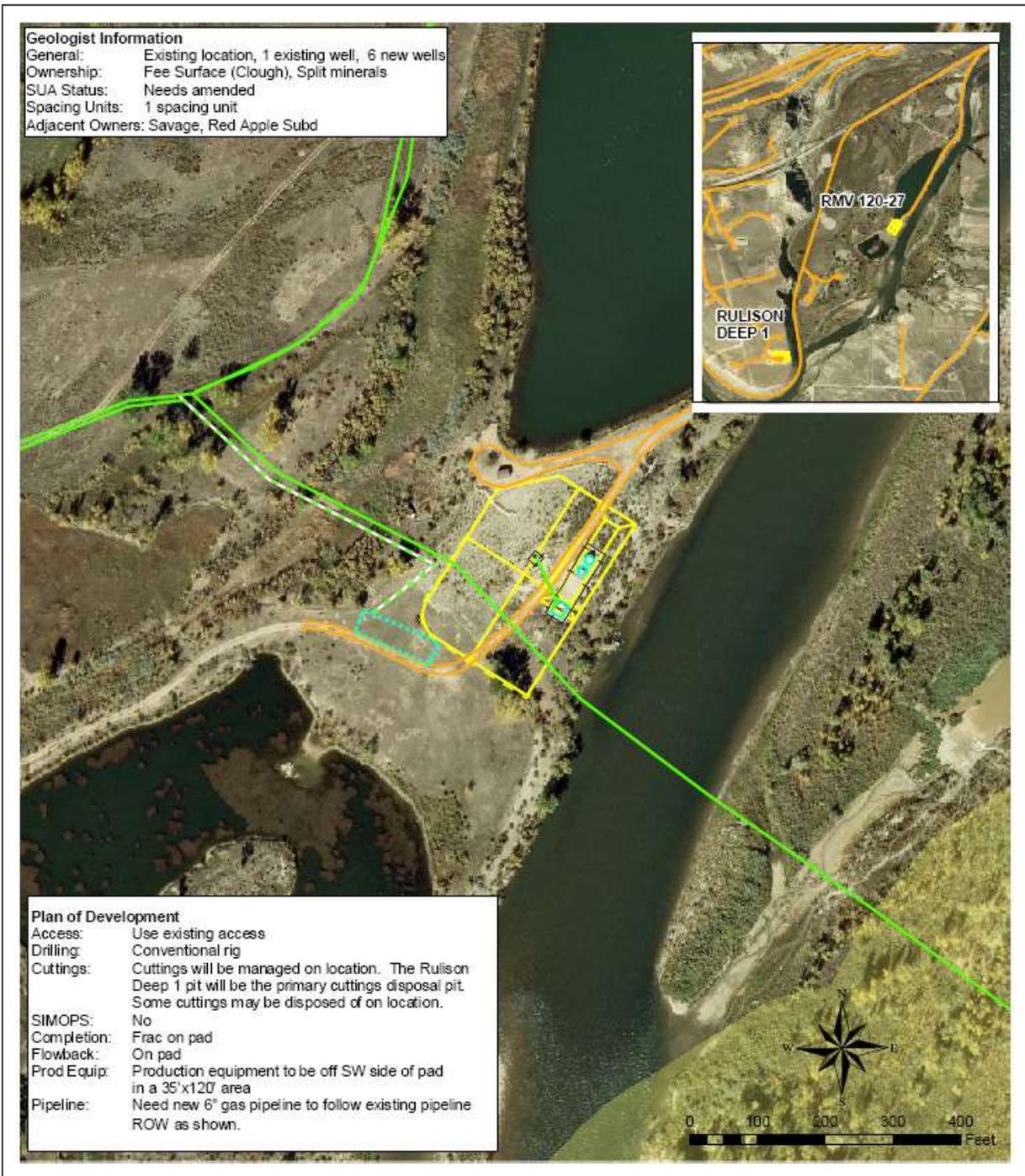
SUMMARY OF LEASE STIPULATIONS

Federal Lease COC2799 has no specific stipulations (i.e., no surface occupancy, controlled surface use, or timing limitations) other than the standard stipulations attached to Federal oil and gas leases. However, reasonable and appropriate conditions of approval (COAs) would be applied to the project by the BLM to protect surface resources, consistent with the current land use plan (see below). The COAs, listed in presented in Appendix A of this EA, would be applied to the individual Applications for Permit to Drill (APDs) for the Federal wells.

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):

Land Use Plan: Glenwood Springs Resource Management Plan (BLM 1984). Amended in November 1991 – Oil and Gas Leasing and Development – Final Supplemental Environmental Impact Statement (FSEIS); amended in March 1999 – Oil and Gas Leasing & Development FSEIS.



Geologist Information
 General: Existing location, 1 existing well, 6 new wells
 Ownership: Fee Surface (Clough), Split minerals
 SUA Status: Needs amended
 Spacing Units: 1 spacing unit
 Adjacent Owners: Savage, Red Apple Subd

Plan of Development
 Access: Use existing access
 Drilling: Conventional rig
 Cuttings: Cuttings will be managed on location. The Rulison Deep 1 pit will be the primary cuttings disposal pit. Some cuttings may be disposed of on location.
 SIMOPS: No
 Completion: Frac on pad
 Flowback: On pad
 Prod Equip: Production equipment to be off SW side of pad in a 35'x120' area
 Pipeline: Need new 6" gas pipeline to follow existing pipeline ROW as shown.

- Legend**
- Pipeline (Valley)
 - Pipeline (Valley, Proposed)
 - Existing Road
 - Proposed Production Equipment Area
 - Existing Fence
 - Existing Well
 - Proposed Daylight Line
 - Proposed Pad or Pit
 - Existing Production Equipment

Williams Production RMT
 RMV 120-27 Plan of Development
 T6S R94W, Section 27



Figure 2. RMV 120-27 Pad and Remote Cuttings Site

Decision: Record of Decision, Glenwood Springs Resource Management Plan Amendment (RMPA), November 1991, page 3: “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 RMPA (BLM 1999).

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

STANDARDS FOR PUBLIC LAND HEALTH

In January 1997, Colorado BLM approved the Standards for Public Land Health. The five standards cover upland soils, riparian systems, plant and animal communities, threatened and endangered species, and water quality. Standards describe conditions needed to sustain public land health and relate to all uses of the public lands. The environmental analysis must address whether the proposed action or alternatives being analyzed would result in impacts that would maintain, improve, or deteriorate land health conditions relative to these resources.

These analyses are conducted in relation to baseline conditions described in land health assessments (LHAs) completed by the BLM. The proposed action would be located in an area that is included in the Rifle West LHA (BLM 2005). However, the LHA was not conducted on private lands and therefore does not apply to the lands on which the project is located.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

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

A variety of laws, regulations, and policy directives mandate the evaluation of the effects of a proposed action and alternative(s) on certain critical environmental elements. Some of the critical elements are not present in the project area; others may be present but would not be affected by project (Table 2). Only the mandatory critical elements that are present and potentially affected are addressed by this EA. In addition to the mandatory critical elements are other resources that would be affected by the proposed action and the no action alternative. These are presented under **Other Affected Resources** (see Table 3).

Critical Elements

Air Quality

Affected Environment

The project area lies within Garfield County, which has been described as an attainment area under Colorado Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS). An attainment area is an area where ambient air pollution quantities are below (i.e., better than) NAAQS standards.

Table 2. Critical Elements of the Human Environment									
<i>Critical Element</i>	<i>Present in the Area</i>		<i>Potentially Affected</i>		<i>Critical Element</i>	<i>Present in the Area</i>		<i>Potentially Affected</i>	
	Yes	No	Yes	No		Yes	No	Yes	No
Air Quality	X		X		Prime or Unique Farmlands		X		X
ACECs		X		X	Special Status Species*	X		X	
Cultural Resources		X		X	Wastes, Hazardous or Solid	X		X	
Environmental Justice	X			X	Water Quality, Surface and Ground*	X		X	
Floodplains	X		X		Wetlands and Riparian Zones*	X		X	
Invasive, Non-native Species	X		X		Wild and Scenic Rivers		X		X
Migratory Birds	X		X		Wilderness and Wilderness Study Areas		X		X
Native American Religious Concerns		X		X					

* Public Land Health Standard

Environmental Consequences

Proposed Action

The Roan Plateau Resource Management Plan Amendment and Environmental Impact Statement (RMPA/EIS) describes potential effects from oil and gas development within the Glenwood Springs Field Office Area (GSFO) (BLM 2006:4-26 to 4-37). Analysis was completed with regard to a near-field and far-field analysis for “criteria pollutants” (particulate matter [PM₁₀ and PM_{2.5}], carbon monoxide, sulfur dioxide, and nitrogen oxides), and hazardous air pollutants (benzene, ethylbenzene, formaldehyde, hydrogen sulfide, toluene, and xylenes). Sulfur and nitrogen deposition, acid neutralizing capacity, and a visibility screening analysis were also completed. Because the visibility screening analysis showed potential impacts at one or more Class I air quality areas (Black Canyon of the Gunnison National Park and the Mt. Zirkel Wilderness), a refined visibility analysis was also completed that considered both Roan Plateau development and cumulative oil and gas development during a 20-year planning horizon. The refined visibility analysis indicated a “just noticeable” impact on visibility for one day at both of these two Class I areas using the projected total of 1,570 new Federal wells. For the other pollutants analyzed, the Roan Plateau RMPA/EIS indicated that oil and gas development at the level assumed in the proposed action of that plan would have either no or negligible long-term adverse impacts on air quality. Since the proposed action is within the range of new development projected in the RMPA/EIS, it is anticipated that two new Federal wells would not have adverse effects on air quality.

Activities described in the proposed action would result in localized short-term increases in emissions from vehicles and drilling equipment and fugitive dust 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, it is anticipated that construction, drilling, and production activities would 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, including graveling of the access road, daily application of water during construction and drilling

activities, and application of a dust suppressant (magnesium chloride or other substance) during the long-term production phase (see Appendix A).

Since the Roan Plateau RMPA/EIS was approved, ongoing scientific research has identified the potential impacts of anthropogenic “greenhouse gas” (GHG) emissions and their effects on global climatic conditions. These anthropogenic GHGs include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and several trace gases, as identified by the Intergovernmental Panel on Climate Change (IPCC). Through complex interactions on a global scale, these GHG emissions 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 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 (2006) 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 greenhouse gas concentrations.”

The assessment of GHG emissions and climate change is an ongoing scientific endeavor. Many existing climate prediction models are global in nature. Climate change science is rapidly advancing and is increasingly able to predict likely future conditions at regional levels. However, scientific uncertainty remains, and the lack of proven scientific tools designed to predict climate change on local scales limits the ability to project potential future impacts of climate change of individual projects.

Although the proposed project would contribute to future emissions of GHGs to the atmosphere, no scientific tool currently exists that allows the translation of specific quantities of emissions from a particular activity into predicted changes in average annual global surface temperature or other effects.

No Action Alternative

Under the no action alternative, the Federal components included in the proposed action would not be approved and constructed, but drilling of the four fee wells would still occur. The resulting air quality impacts would thus be reduced but not eliminated.

Cultural Resources

Affected Environment

A Class III cultural resource inventory (GSFO# 1109-12) was conducted of a 96-acre block containing the project area and pad location by Grand River Institute in April of 2009. No properties that are considered eligible for listing on the National Register of Historic Places were identified in this project area. Therefore, no formal consultation with the Colorado State Historic Preservation Officer (SHPO) was needed and a determination of “**No Historic Properties Affected**” was made in accordance with the National Historic Preservation Act, as amended (16 USC 470f), National BLM/SHPO Programmatic Agreement (1997), and Colorado Protocol (1998).

Environmental Consequences

Proposed Action

No direct impacts to cultural resources would result from the implementation of the proposed action. However, indirect long-term cumulative impacts from increased activity and the presence of project

personnel could result in a range of impacts to known and undiscovered cultural resources in the vicinity of the project. These impacts could range from illegal collection and excavation to vandalism.

A standard COA for cultural resource protection would be attached to the APDs (Appendix A). The importance of this COA should be stressed to Williams and its contractors, including informing them of their responsibilities to protect and report any cultural resources encountered during drilling and development operations.

No Action Alternative

Under this alternative, the Federal wells would not be drilled, although construction for the four fee wells would still occur. Therefore, many of the direct impacts described for the proposed action would occur but without the mitigation measures associated with the Federal wells, and cultural resources in the general area would remain vulnerable to damage from illegal activities. The standard COA for cultural resource protection would not be attached to the permit, although Colorado Revised Statute CRS 24-80-1301 for Historic, Prehistoric, and Archaeological Resources and for Unmarked Human Graves would continue to apply.

Invasive Non-native Species

Affected Environment

The existing pad is located adjacent to the Colorado River. Narrowleaf cottonwood (*Populus angustifolia*) and willow (*Salix* spp.) are the dominant native species. Numerous noxious weeds are present around the vicinity of the pad, including tamarisk (*Tamarix ramosissima*), Russian knapweed (*Acroptilon repens*), redstem filaree (*Erodium cicutarium*), and cheatgrass (*Anisantha tectorum*). Undesirable species such as kochia (*Kochia* sp.) and Russian-thistle (*Salsola* sp.) are present also.

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 these 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 the APDs as COAs (see Appendix A).

No Action Alternative

Under the no action alternative, Federal wells would not be drilled, although construction of the four fee wells would still occur. Invasive, non-native species would spread if left untreated.

Migratory Birds

Affected Environment

Vegetation in the project area adjacent to the Colorado River transitions from bank-side riparian to partially disturbed (gravel pits and access roads) shrubland habitats. The area is composed of both immature and mature individuals of narrowleaf cottonwood, box-elder (*Negundo aceroides*), and willow. Shrubland vegetation is composed mainly of rubber rabbitbrush (*Chrysothamnus nauseosus*) with

scattered sagebrush (*Artemisia tridentata*) and various wheatgrass species that provide forage for livestock grazing. Non-native tamarisk is common throughout the project area in areas where groundwater tables are high.

This range of dense vegetation provides cover, forage, and nesting habitat for a variety of migratory birds. Riparian habitats typically provide cover, feeding, and nesting habitats for a much greater number of species than adjacent habitats due to the vertical and horizontal diversity of the community, the proximity to water, and usual proximity to other habitats.

Migratory species that may be found in riparian habitat of the project area may include the cordilleran flycatcher (*Empidonax occidentalis*), American robin (*Turdus migratorius*), Bullock's oriole (*Icterus bullockii*), yellow warbler (*Dendroica petechia*), American goldfinch (*Carduelis tristis*), and song sparrow (*Melospiza melodia*). Migratory species in the adjacent shrublands areas may include the western kingbird (*Tyrannus vociferans*), western meadowlark (*Sturnella neglecta*), lark sparrow (*Chondestes grammacus*), and vesper sparrow (*Pooecetes gramineus*). Another migrant, the great blue heron (*Ardea herodias*), is also present along the Colorado River within the GSFO area, where it nests in tall trees and hunts for fish along the river's edge.

Raptor species commonly found in nesting in riparian woodlands include the American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), Cooper's and sharp-shinned hawks (*Accipiter cooperii* and *A. striatus*), and great horned owl (*Bubo virginianus*). Of these, all but the two accipiter species may use the mature trees for nesting but hunt in nearby open habitats, while the accipiters would both nest and hunt among the trees.

Three species on the U. S. Fish and Wildlife Service (USFWS) 2008 list of Birds of Conservation Concern (BCC) may occur in the project area: the bald eagle (*Haliaeetus leucocephalus*), Lewis's woodpecker (*Melanerpes lewis*), and willow flycatcher (*Empidonax traillii*). Lewis's woodpeckers are potentially present in areas with mature cottonwoods, while willow flycatchers are potentially present in riparian habitats dominated by stands of tall willows or similar species.

The bald eagle was removed from the Federal list of threatened or endangered species in 2007, but monitoring will continue through 2012 before making the delisting permanent. It remains protected by the Bald and Golden Eagle Protection Act (BGEPA) and, like most native bird species, by the Migratory Bird Treaty Act (MBTA). During the onsite meeting, an active bald eagle nest was observed within 0.25-mile area of the pad location. The nest contained two young, which fledged (left the nest) successfully in June 2009. The young and one or both adults may remain in the vicinity of the nest for several weeks following fledging but, due to their mobility, are less susceptible to disturbance than during the nestling stage.

Environmental Consequences

Proposed Action

Because the proposed project primarily occupies an existing pad and would only be reconstructed with minimal new surface disturbance, the loss of potential habitat would be limited to approximately 0.28 acre. Most of this area would consist of weedy herbaceous vegetation or low shrubs. The operator believes that a few cottonwoods adjacent to the pad will not have to be removed. If so, however, this would result in a very minor impact to the overall riparian habitat of the Colorado River corridor in the project vicinity. Because of proximity to existing facilities, these trees are not expected to support future nesting by raptors or Lewis's woodpeckers, nor is the potentially affected habitat suitable for nesting by the willow flycatcher.

The greater effect would occur during construction and completion activities when habitat effectiveness would be reduced as a result of development activity. It is possible that during the well development phase, individual birds could be displaced due to noise and human activity. Effects of displacement could include increased risk of predation or reproduction failure if adjacent habitat is at carrying capacity or if disturbance leads to nest abandonment. Impacts would be temporary (<3 years), but some disturbance-related effects could occur during the long-term production and maintenance phase of the project.

If the bald eagle nest is active again in 2010, the operator will need to contact the USFWS to ensure that any construction, drilling, or completion activities or other operations involving noise and intense activity to not result in a violation of the BGEPA or the MBTA (see Appendix A).

The development of reserve pits may attract waterfowl and other migratory birds for purposes of resting, foraging, or as a source of water. Contact with produced water and drilling and completion fluids has the potential to cause death and injury (e.g., acute or chronic toxicity, compromised insulation). Based on this potential, birds would be prevented from accessing the reserve pit (see Appendix A).

No Action Alternative

Under the no action alternative, four fee wells would still be developed. As a result, potential impacts to migratory birds would be reduced, but not eliminated.

Native American Religious Concerns

Affected Environment

The Ute Indian Tribes claim this area as part of their ancestral homeland. At present, no Native American concerns are known within the project area and none were identified during the cultural resource records search or inventories. The Ute Tribe of the Uintah and Ouray Bands, the primary Native American tribe in this area of the Glenwood Springs Field Office, 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.

Environmental Consequences

Proposed Action

Although there would be no direct impacts from the proposed action, indirect impacts from increased access and personnel in the vicinity of the proposed project could result in impacts to unknown Native American resources ranging from illegal collection to vandalism. A Standard Education/Discovery COA for the protection of Native American values would be attached to the APDs (Appendix A). The importance of these COAs should be stressed to Williams and its contractors, including informing them of their responsibilities to protect and report any cultural resources encountered.

No Action Alternative

The impacts of the no action alternative would be reduced but not eliminated. Indirect impacts from increased access and personnel in the vicinity of the proposed project could result in impacts to unknown Native American resources ranging from illegal collection to vandalism. The standard COA for cultural resource protection would not be attached to the permit, although CRS 24-80-1301 for Historic, Prehistoric, and Archaeological Resources and for Unmarked Human Graves would apply.

Special Status Species

Affected Environment

Federally Listed, Proposed, or Candidate Plant Species

According to the species list from the USFWS (<http://mountain-prairie.fws.gov/endspp/CountyLists/COLORADO.pdf>), the following Federally listed, proposed, or candidate threatened or endangered plant species may occur within or be impacted by actions occurring in Garfield County: Uinta Basin hookless cactus (*Sclerocactus glaucus*), Parachute penstemon (*Penstemon debilis*), Ute ladies'-tresses (*Spiranthes diluvialis*), and DeBeque phacelia (*Phacelia submutica*).

The results of a February 2009 plant survey indicate the project area contains no Federally listed, proposed, or candidate plant species or suitable habitat for these species.

BLM Sensitive Plant Species

BLM sensitive plant species with habitat and/or occurrence records in Garfield County include adobe thistle (*Cirsium perplexans*), DeBeque milkvetch (*Astragalus debequaeus*), Naturita milkvetch (*Astragalus naturitensis*), Roan Cliffs blazing star (*Mentzelia rhizomata*), Piceance bladderpod (*Lesquerella parviflora*), and Harrington's penstemon (*Penstemon harringtonii*).

The results of a February 2009 inventory indicate the project area contains no BLM sensitive plant species or suitable habitat for these species.

Federally Listed, Proposed, or Candidate Animal Species

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

Four Big-River Fishes (Endangered). The four endangered big-river fishes—the Colorado pikeminnow, bonytail, humpback chub, and razorback sucker—are found in the mainstem Colorado River in Utah and extreme western Colorado. Designated critical habitat for the Colorado pikeminnow and razorback sucker extends within the Colorado River and 100-year floodplain as far upstream as the State Highway 13 bridge at Rifle. This encompasses approximately 35 river miles within the Glenwood Springs Field Office (GSFO) area, of which 1.5 miles are on BLM lands. Both of these species require a complexity of river and backwater habitats to support different life states and seasonal habitat uses. Although neither is known to occur in the GSFO area, they may be present, and recent modifications to the Colorado River in DeBeque Canyon to remove movement barriers have increased the potential for dispersal into the area. The bonytail and humpback chub have not been documented within the GSFO area, and designated critical habitat occurs no closer than 50 river miles downstream. These species prefer swift, deep, canyon-bound river reaches.

Greenback Cutthroat Trout (Threatened). The greenback cutthroat trout is a small salmonid fish native to the headwaters of the South Platte and Arkansas River drainages in Colorado and a small segment of the Platte River drainage in Wyoming. It is one of three subspecies of cutthroat trout that currently occur in

Colorado. Based on recent genetic work, greenbacks have been documented in certain waters across the west slope of Colorado outside their native (east slope) range. It is likely that greenbacks were stocked into a few small streams in western Colorado when the subspecies was still common in its natural range.

Greenbacks, like all cutthroat subspecies, inhabit coldwater streams and lakes that provide adequate spring spawning habitat. Spawning generally occurs when water temperatures reach 5°C to 8°C. Greenbacks feed on a wide variety of organisms, but their primary food source is aquatic and terrestrial insects. One population of greenback cutthroat trout has been found within the GSFO area, in Cache Creek on National Forest System lands and private lands.

Mexican Spotted Owl (Threatened). The Mexican spotted owl is believed not to occur in the GSFO area, and potentially suitable habitat is limited to forested mountains and canyons. Therefore, suitable habitat for this species is not present in the project vicinity.

Western Yellow-billed Cuckoo (Candidate). The western yellow-billed cuckoo occupies mature riparian forests dominated by cottonwoods or other large deciduous trees and with a dense shrub understory. Unlike many species of riparian birds, yellow-billed cuckoos do not venture outside the riparian habitat to feed in nearby more open habitats but instead remain within the canopies of the trees or tall shrubs.

Canada Lynx (Threatened). This medium-sized predator is slightly larger than the more common bobcat (*Lynx rufus*) and more often associated with higher elevation (subalpine) zones. In Colorado, the lynx was historically present at low densities in some of the more rugged or remote mountain ranges of the state. Preferred habitat consists of northern coniferous forests, which in Colorado are represented by Engelmann spruce and subalpine fir. Spruce-fir forests with dense tree cover, often in association with rock outcrops or boulders, are the principal habitat type in Colorado. Aspen forests are also used by lynx, although primarily during non-winter seasons. Lynx typically den under rock overhangs or deadfall.

The U.S. Forest Service (USFS) has mapped suitable denning, winter, and other habitat for lynx within the White River National Forest (WRNF), portions of which are adjacent to BLM lands within the GSFO. The mapped suitable habitat in the WRNF comprises several areas known as Lynx Analysis Units (LAUs). Several LAUs border BLM lands along the I-70 corridor from east of Wolcott to west of DeBeque. While BLM lands within the GSFO area are generally not suitable habitat *per se*, they may support movement by animals dispersing to a new area or, potentially, moving to lower elevations during severe winter weather in search of prey.

BLM Sensitive Animal Species

BLM sensitive animal species with habitat and/or occurrence records in the area (in addition to the bald eagle – see section on Migratory Birds, above) include four BLM sensitive fish species (roundtail chub [*Gila robusta*], flannelmouth sucker [*Catostomus latipinnis*], bluehead sucker [*Catostomus discobolus*], and Colorado River cutthroat trout [*Oncorhynchus clarki pleuriticus*])—as well as three amphibians (Great Basin spadefoot [*Spea intermontana*], boreal toad [*Bufo boreas*], and northern leopard frog [*Rana pipiens*]) and two reptiles (milk snake [*Lampropeltis triangulum taylori*] and midget faded rattlesnake [*Crotalus viridis concolor*]). In addition, are known to occur in the GSFO area.

Three of the BLM sensitive nongame fish species—the roundtail chub, bluehead sucker, and flannelmouth sucker—occur primarily in the mainstem Colorado River but also use larger tributary streams for spawning and may reside there year-round. Another native species, the mountain sucker (*Catostomus platyrhynchus*) is known in one stream within the GSFO area, Piceance Creek, and therefore not potentially affected by the project.

The Colorado River cutthroat trout is the only native trout of the Colorado River Basin. Like all cutthroat subspecies, it inhabits coldwater streams and lakes. This subspecies is not known to occur in the mainstem Colorado River in the GSFO area due to predation and competition with introduced predatory sportfishes (including non-native trouts) and hybridization with introduced non-native cutthroat subspecies. Where it does occur in the GSFO area and elsewhere in western Colorado, populations of Colorado River cutthroats are typically found in small streams that have not been stocked with other trouts and where upstream migration of non-natives from stocked waters is prevented by a barrier such as a waterfall or other blockage.

The three sensitive amphibians and two sensitive reptiles listed above are potentially present in the project area, except for the boreal toad. This species occurs in small streams and ponds at elevations higher than those of the project area. The midget faded rattlesnake, although potentially present, is unlikely due to a lack of the type of rocky terrain it prefers. The milk snake is a species of moist habitats, including riparian corridors; the Great Basin spadefoot breeds in seasonal pools but moves into drier terrain to feed; and the northern leopard frog is an aquatic species that inhabits perennial waters.

Environmental Consequences

Proposed Action

Federally Listed, Proposed, or Candidate Plant Species

The project area contains no Federally listed, proposed, or candidate plant species or their suitable habitat. Therefore, BLM has determined that the proposed action would have “**No Effect**” on these species.

BLM Sensitive Plant Species

The project area contains no BLM sensitive plants or suitable habitat. Therefore, there would be no impacts to these species.

Federally Listed, Proposed, or Candidate Animal Species

Endangered Colorado River Fishes. Construction activities would increase the potential for soil erosion and sedimentation. Although a minor temporary increase in sediment transport to the Colorado River may occur, it is unlikely that the increase would be detectable above current background levels. In any case, the Federally listed, proposed, or candidate fish species associated the Colorado River are adapted to naturally high sediment loads and would not be affected.

Surface runoff of pollutants from the project area also has the potential to impact Colorado River fishes. Any leaks from trucks, drilling equipment, tanks, or ancillary facilities would be likely to reach the river during runoff events. To reduce the potential for such contamination, Williams has agreed to a series of mitigation measures, which are outlined in Appendix A.

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

In May 2008, BLM prepared a Programmatic Biological Assessment (PBA) that addresses water depleting activities associated with BLM's fluid minerals program in the Colorado River Basin in Colorado. In response to BLM's PBA, the USFWS issued a Programmatic Biological Opinion (PBO) (ES/GJ-6-CO-08-F-0006) on December 19, 2008, which determined that BLM water depletions from the Colorado River Basin are not likely to jeopardize the continued existence of the Colorado pikeminnow, bonytail, humpback chub, or razorback sucker and that BLM water depletions are not likely to destroy or adversely modify designated critical habitat. This project has been entered into the Glenwood Springs Field Office Fluid Minerals Water Depletion Log, which will be submitted to the Colorado State Office at the end of the Fiscal Year.

A biological assessment (BA) prepared for BLM by Van Graham of WestWater Engineering was submitted to the USFWS by BLM on May 21, 2009, pursuant to Section 7 of the Endangered Species Act (ESA). Based on the information summarized above, the BA reached a determination of “**May Affect, Not Likely to Adversely Affect**” for the proposed action relative the four endangered Colorado River fishes. The USFWS issued its concurrence with that determination in a letter dated June 19, 2009 (see Appendix C).

Greenback Cutthroat Trout, Mexican Spotted Owl, and Canada Lynx. These species are not likely to occur in the project area, with the possible exception of transitory movement through the area by lynx dispersing between suitable habitats. Therefore, BLM has determined that the project would have “**No Effect**” on these species.

Western Yellow-billed Cuckoo. An effects determination is not required for a candidate species, but the potential for occurrence of the western yellow-billed cuckoo in the project area is low, and direct impacts to riparian habitat would be minor. Potentially, however, cuckoos could nest in the riparian habitat of the Colorado River near the project site and be displaced by disturbance from construction and drilling activities. The potential for this impact is considered negligible.

BLM Sensitive Animal Species

Native Minnows and Suckers. The three sensitive nongame fish species in the Colorado River basin of the GSFO area—the roundtail chub, bluehead sucker, and flannelmouth sucker—occur primarily in the mainstem Colorado River and therefore would be subject to the same potential impacts as the four endangered big-river fishes discussed above. However, like the endangered species, inflow of sediments would not represent an adverse impact, and measures to minimize the risk of transport of pollutants into the river during runoff events (see Appendix A) would apply equally to these species.

Colorado River Cutthroat Trout. Because Colorado River cutthroat trout do not occur in the mainstem Colorado River in the GSFO area or in tributaries in proximity to the project area, no effects on this sensitive subspecies are anticipated.

Great Basin Spadefoot, Boreal Toad, and Northern Leopard Frog. Neither of the two amphibians potentially present in the project vicinity—the Great Basin spadefoot and northern leopard frog (*Rana pipiens*)—is known to occur. However, if these species are present, their larvae (tadpoles) would be vulnerable to the same types of environmental physical and chemical stressors as fish, including transport of sediments and chemical pollutants into water bodies used for reproduction. Direct mortality of adults, eggs, and larvae could result from overland operation of vehicles, particularly for the spadefoot, which ventures into uplands to feed. Because of the small amount of new disturbance in upland habitats and no disturbance to the Colorado River habitat, the risk of impacts to these species is negligible.

Milk Snake and Midget Faded Rattlesnake. Of these sensitive reptile species, only the milk snake is reasonably likely to occur within or near the project area—primarily in the Colorado River riparian corridor and adjacent moist meadows. Direct mortality to this species could result from overland travel by vehicles or, potentially, excavation for the slight increase in size of the adjacent pad. This potential impact would be limited to the active season of April to October. Based on the small amount of new disturbance and avoidance of the riparian woodland, impacts to the milk snake are expected to be negligible.

No Action Alternative

Federally Listed, Proposed, or Candidate Plant Species and BLM Sensitive Plant Species

The no action alternative would not cause impacts to any BLM sensitive, 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 and BLM Sensitive Animal Species

Under the no action alternative, the development of four fee wells would still occur. As a result, impacts to sensitive animals would be similar to those for the proposed action, although reduced due to a slightly smaller area of new disturbance and less vehicular traffic.

Wastes, Hazardous or Solid

Affected Environment

BLM Instruction Memoranda numbers WO-93-344 and CO-97-023 require that all National Environmental Policy Act documents list and describe any hazardous and/or extremely hazardous materials that would be produced, used, stored, transported, or disposed of as a result of a proposed project. The Glenwood Springs Resource Area, Oil & Gas Leasing and 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 which 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. 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 construction and operations would be kept onsite in limited quantities and trucked to and from the site as required. No hazardous substance as defined by 40 CFR 355 would be used, produced, stored, transported, or disposed of in amounts above threshold quantities.

Surface water or groundwater could be impacted under the proposed action. Pollutants that might be released during the operational phase of the project could include condensate, produced water (if the wells in the area produce water), and glycol (carried to the site and used as antifreeze.) While uncommon, an accident could occur that results 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, implemented best management practices, and contingency plans and emergency response resources are expected to adequately mitigate any potential hazardous or solid waste issues associated with the proposed action.

No Action Alternative

Under the no action alternative, the Federal components included in the proposed action would not be approved and constructed, but drilling of the four fee wells would still occur. This would involve an approximate 33% decrease in drilling, completion, and production activity and traffic. Since the large majority of hazardous waste contamination risk occurs during the drilling, completion, and production phases, the risk of hazardous waste contamination in the no action alternative would be approximately 33% less than the risk generated by the proposed action.

Water Quality, Surface and Ground

Surface Water

Affected Environment

Proposed activities would be located within a 48,282-acre sub-watershed designated “Colorado River below Cache Creek” within the larger (5th code) watershed designated “Colorado River below Rifle

Creek.” Within this subwatershed, all creeks north of the Colorado River are unnamed; of the named creeks south of the river, Porcupine Creek enters the river directly across from the RMV 120-27 pad.

According to the *Stream Classifications and Water Quality Standards* (CDPHE, Water Quality Control Commission [WQCC] Regulation No. 37) (CDPHE 2007), all drainages within this subwatershed with the exception of Beaver Creek are within Segment 4a, which includes all tributaries to the Colorado River from its confluence with the Roaring Fork River to a point immediately below its confluence with Parachute Creek. Following is a brief description of segment 4a.

- Segment 4a – This segment has been classified aquatic life cold 2, recreation 2, water supply, and agriculture. Aquatic life cold 2 indicates that this water course is not capable of sustaining a wide variety of cold or warm water biota due to habitat, flows, or uncorrectable water quality conditions. Recreation class 2 refers to waters that are not suitable or intended to become suitable for primary contact recreation. This segment is, however, suitable or intended to become suitable for potable water supplies and agricultural purposes that include irrigation and livestock use. At this time, there are no water quality data for these unnamed ephemeral drainages.

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

The pad is located within the 100-year floodplain of the Colorado River, as determined by Garfield County mapping based on data derived from the Federal Emergency Management Agency (FEMA) and U.S. Army Corps of Engineers (USACE). At its closest point, the existing pad is approximately 30 feet northwest of the Colorado River, from which it is separated by a berm; planned expansion will not reduce this distance. To the west of the pad is a narrow oxbow lake; just to the northeast and southwest are two manmade ponds, covering approximately 16.5 acres and 5 acres, respectively (Figure 3).

Environmental Consequences

Proposed Action

Potential impacts to surface water associated with the proposed action include increased erosion and sedimentation into adjacent ponds and the Colorado River; and contamination of these water bodies by drilling fluids, produced water, or condensate.

Surface waters would be most susceptible to sedimentation during construction, drilling, and completion activities, which would last approximately 30 to 45 days per well. After this period, reclamation activities would substantially reduce surface exposure, decreasing the risk to surface waters over the long term.

The existing access road enters the site from the north, along the top of the bank of the Colorado River, and channels runoff into the pond just north of the pad site. According to the land owners and Corps of Engineers maps, the edge of this berm between the road and river was built up following the 1984 flood, such that it now averages approximately 12 feet above normal river stage. During that flood, the river crested its banks and flooded the pad site. Since the 1984 flood had the highest discharge on record downstream at Lee’s Ferry in Arizona (USGS 2004), the existing berm appears to be sufficient to withstand a 100-year flood. However, the berm ends a few hundred feet downstream of the pad site, so flood waters could still back up into the site, although they would not have the erosive force that they would have if the augmented berm adjacent to the pad were not present.



Figure 3. Site location and adjacent water bodies.

The existing access road would remain in place beyond the life of the well pad (at least 20 to 30 years), and would channel runoff toward the pad during periods of precipitation, as it has been doing for the last 25-plus years. The proposed extension of the access road will only add a few feet of road and will have no hydrologic impact. Sedimentation and other water quality impacts associated with the drilling pad, access road, and pipeline installation should be reduced through the implementation of BMPs and other preventive measures. As proposed, these measures would include preserving existing vegetation wherever possible, crowning the road surface, installing culverts and drainage systems, and placing containment structures around tanks, as well as interim reclamation practices following the production phase of the proposed action.

Other elements of the proposed action are designed to mitigate risks to surface waters associated with the release of drilling fluids, produced water, and condensate. All cuttings are to be hauled offsite and out of the 100-year floodplain. The reserve pit used to contain drilling fluids would be lined to prevent infiltration into surrounding soils. A minimum of 2 feet of freeboard would 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. Once completion operations are complete, excess liquids would be allowed to evaporate and backfilling of the pit would be performed in a manner that would avoid incorporating the mud into surface soils.

Because the project area is located in an area with high concentrations of bird species, an open pit containing drilling fluids may pose a risk to migratory birds. While the pit is open and fluids are present, sufficient netting shall be installed to prevent access to any birds in the project area.

Tanks used to store produced water and condensate would be placed in secondary containment (a lined steel ring) to prevent offsite release. In the event of an accidental release, produced water and condensate would be confined for cleanup in the containment area and would not migrate to surrounding soils or surface waters. Pipelines constructed to transport liquids from the tanks would be pressure-tested to detect leakage prior to use.

The operator has agreed to—and the landowner has approved—sampling of the pond to the south of (downgradient from) the pad site. Sampling will test for diesel- and gasoline-range hydrocarbons and will occur before, during, and after well completion activities take place.

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

No Action Alternative

This alternative would continue to have potential impacts on surface water if Colorado Oil and Gas Conservation Commission (COGCC) issued APDs for the four fee wells planned on the existing pad. During the construction phase, the potential for impacts in this alternative would be approximately 33% less than those of the proposed action since pad expansion would still occur, as well as possible pipeline installation.

Waters of the U.S.

Affected Environment

The proposed project would occur within the 100-year floodplain of the Colorado River, as mapped by FEMA and USACE. Section 404 of the Clean Water Act requires a nationwide permit from the USACE prior to discharging dredged or fill material into waters of the United States as defined by 33 CFR Part 328. However, the USACE has determined that this project would not affect any waters of the U.S. and would thus not require any Section 404 permits.

Executive Order 11988 requires Federal agencies to “avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative” (FEMA 1977). Since approval of this document constitutes indirect support of development within the 100-year floodplain, it is necessary to assess the impacts of this project on the floodplain. This is discussed further below.

Environmental Consequences

Proposed Action

The proposed action would not include any intentional deposition of fill into the Colorado River, along its bank, or within any tributary due to construction activities, although the eastern edge of the reserve pit will be within 50 feet of the river. There is a small potential for stormwater runoff to enter the pad site, but proper implementation of BMPs, as discussed elsewhere in the sections on Water Quality and Soils, should eliminate this risk.

Executive Order 11988 provides the following direction to Federal agencies considering approval of development within 100-year floodplains: “If impacts cannot be avoided, develop measures to minimize the impacts and restore and preserve the floodplain, as appropriate” (FEMA 1977). As discussed above and in Appendix A, various measures would be implemented to minimize impacts and preserve the existing floodplain. These include transporting most or all cuttings to a site outside the 100-year floodplain, performing well pad and access road construction so as to avoid additional water impoundment, reclaiming the reserve pit prior to spring high water, and re-establishing vegetative characteristics similar to current habitat conditions onsite during interim reclamation.

No Action Alternative

This alternative would also pose no risk to waters of the U.S. if COGCC issued APDs for the four fee wells planned on this pad. The potential impact with regard to Executive Order 11988 would be approximately 33% less than the already-minimal impact of the proposed action.

Groundwater

Affected Environment

The proposed activities are located within the Colorado Division of Water Resources (CDWR), Water Division 5, Colorado River Basin Main Stem. The groundwater in this division is generally found in both alluvial and sedimentary aquifers.

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.

The most important bedrock aquifers are known as the upper and lower Piceance Basin aquifer systems. These consolidated bedrock aquifers occur within and above the large oil shale reserves. The upper and lower aquifers are separated by the Mahogany Zone of the Parachute Creek Member of the Green River Formation. The upper aquifer system is about 700 feet thick and consists of several permeable zones in the Uinta formation and the upper part of the Parachute Creek Member (EPA 2004). The Uinta Formation is not present within this study area, but merges with several tongues of the Parachute Creek Member in the northern Piceance Creek basin, a smaller Tertiary oil-shale basin within the larger Piceance basin. Sub-aquifers in the upper zone consist of silty sandstone and siltstone, with enhanced permeability from natural fracturing. The lower aquifer system is about 900 feet thick and consists of a fractured dolomitic marlstone of the lower Parachute Creek Member (EPA 2004). It is semi-confined below the Mahogany Zone and above the Garden Gulch Member (the middle member) of the Green River Formation. Natural fracturing and dissolution of evaporite minerals has enhanced permeability in this zone. Both bedrock aquifers overlie the older Cretaceous Mesaverde Group, the target zone of the subject wells. South of the Colorado River, these upper Tertiary-age aquifers have largely been eroded off, exposing the lower Green River and Wasatch Formations. The surface formation of the RMV 120-27 well pad is Quaternary Alluvium (Qa), which is defined as chiefly silt, sand and gravel, found in flood plains, alluvial fans, and low terraces. Terrace gravel underlies numerous topographic benches, or terraces, adjacent to the Colorado River. Terrace gravel ranges in thickness from as little as 6 feet to more than 100 feet, with an average thickness of 20 to 50 feet (CGS 2002). The proximity of this well pad to the Colorado River indicates this pad is most likely underlain by river terrace gravels.

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 through confining layers and into overlying aquifers or by withdrawal from wells (USGS 2007a). The natural discharge areas generally are found along the Colorado River and its tributaries (USGS 2007b).

According to the CDWR, six active fresh-water wells are located within a 0.5-mile radius of the RMV 120-27 well pad within Section 27. At least three of the fresh water wells have augmented yields used for industrial and irrigation purposes. Water yields for these wells range from 250 gallons per minute (gpm) to 900 gpm. Well depths range between 210 feet for the deepest and 75 feet for the shallowest, with water levels ranging between 56 feet and 167 feet. Three additional domestic-use wells were also identified, with well depths ranging between 50 feet and 172 feet. Water levels were 19 feet at the shallowest well and 126 feet for the deepest well, and water yields were good, between 9.5 and 15 gpm.

The nearest well to the proposed activities is greater than 1,300 feet away, located on the opposite bank of the Colorado River. Numerous fresh water wells are located within a 1-mile radius, with the majority of them found to the east in Section 26, and to the south in Section 34. Five fresh-water wells are found in Section 34. Of these wells, two are monitoring wells, and three are domestic-use wells. Well depths range from 80 feet to 210 feet, with water levels between 46 feet and 167 feet at the deepest. Well yields

are generally good, ranging from 5 to 15 gpm. Four freshwater wells are found east of the proposed activities in Section 26. Two of these are augmented for irrigation use, and two are domestic-use. Well depths for these wells range between 75 feet and 210 feet, with water levels less than 120 feet. Fifteen (15) gpm well yields are listed for the domestic wells, while the augmented wells yield 900 and 50.6 gpm. With the deepest of all the wells identified at 210 feet, it is likely all are completed in shallow alluvial aquifers, as is expected near the Colorado River.

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, and would be 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 and surface casing would minimize the effects, as well as cementing the production casing to 200 feet above the top of the Mesaverde Group. It is highly unlikely that any deep groundwater resources would be affected (1,000 feet or less), as 4,000 feet of strata separate the gas zone from fresh water zones. Thick impermeable layers of rock at the top of the Williams Fork Formation would prevent water or hydrocarbons from migrating to shallow potable water zones.

No Action Alternative

Under the no action alternative, impacts to groundwater resources would be even more unlikely, given that two of the six proposed wells would not be drilled.

Wetlands and Riparian Zones

Affected Environment

No wetlands are present within the project area that could potentially be impacted by the proposed action. Riparian vegetation is present along the edges of the existing pad, but its extent is constrained by the limited amount of land adjacent to the pad.

Environmental Consequences

Proposed Action

No wetlands are present within the project area. A small stand of cottonwood trees is situated within the bounds of the proposed disturbance. Though they make up a small portion of the riparian vegetation around the pad, the operator will work to either minimize or mitigate removal of these trees.

No Action Alternative

The no action alternative would not impact wetlands. Its impact on riparian vegetation could be slightly less, since the reduced number of wells to be drilled would make it more likely that the small stand of cottonwood trees within the proposed pad boundary could be left unaffected. However, overall the

presence of the four fee wells would cause similarly minor impacts to riparian vegetation as in the proposed action.

Other Affected Resources

In addition to the critical elements, the resources presented in Table 3 were considered for impact analysis relative to the proposed action and no action alternative. Resources that would be affected by the proposed action and no action alternative are discussed below.

Table 3. Other Resources Considered in the Analysis			
<i>Resource</i>	<i>NA or Not Present</i>	<i>Present but Not Affected</i>	<i>Present and Affected</i>
Access and Transportation			X
Cadastral Survey	X		
Fire/Fuels Management		X	
Forest Management		X	
Geology and Minerals			X
Law Enforcement	X		
Paleontology			X
Noise			X
Range Management			X
Realty Authorizations	X		
Recreation	X		
Socio-Economics			X
Soils			X
Vegetation			X
Visual Resources			X
Wildlife, Aquatic			X
Wildlife, Terrestrial			X

Access and Transportation

Affected Environment

The proposed project area is located 5 miles southwest of Rifle, Colorado adjacent to the Colorado River. The area is accessed via the I-70/West Rifle exit, then proceeding approximately one mile on the I-70 Frontage Road to an unmarked private gravel drive. The project area is located approximately 0.5 mile down the gravel drive and through two locked gates.

Environmental Consequences

Proposed Action

The proposed action would result in a substantial increase in truck traffic. The largest increase would be during rig-up, drilling, and completion activities. Data indicate that approximately 1,160 truck trips over

a 30-day period would be required to support the drilling and completion of each well (Table 4). Once the wells are producing, traffic would decrease to occasional visits for monitoring or maintenance activities, and hauling produced water and condensate. Each well may have to be recompleted once per year, requiring three to five truck trips per day for approximately one week.

Table 4. Traffic Associated with Drilling and Completion Activities		
<i>Vehicle Class</i>	<i>Trips per Well</i>	<i>Percentage of Total</i>
16-wheel tractor trailers	88	7.6%
10-wheel trucks	216	18.6%
6-wheel trucks	452	39.0%
Pickup trucks	404	34.8%
Total	1,160	100.0%
Source: BLM 2006. Note: Trips by different vehicle types are not necessarily distributed evenly during drilling. The drilling and completion period is approximately 30 days per well.		

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

No Action Alternative

This alternative would continue to have potential impacts on access and transportation if COGCC issued APDs for the four fee wells. The potential for impacts in this alternative would be approximately 33% less than those of the proposed action since pad expansion and well development would still occur.

Geology and Minerals

Affected Environment

The project area is located within the southern Piceance Basin, a broad elongate structural basin located at the eastern edge of the Colorado Plateau. The basin is highly asymmetrical and deepest along its eastern side near the White River Uplift, where more than 20,000 feet of sedimentary rocks are present. It is bounded on the north by the Uinta Mountain uplift, on the east by the Grand Hogback Monocline, which lies along the west flank of the White River Uplift, on the southeast by the Gunnison and Uncompahgre Uplifts, and separated from the Uinta Basin to the northwest by the Douglas Creek Arch. Surface exposures in the Piceance Basin are primarily sedimentary rocks of the Green River and Wasatch Formations.

The target zone is the Mesaverde Group, which lies unconformably below the Wasatch Formation, and is sharply upturned to near vertical along the Grand Hogback. The Mesaverde can be over 7,000 feet in thickness within the Piceance Basin, but within this area is estimated to be approximately 5,000 feet thick. The Mesaverde Group is often called the Mesaverde “Formation” and includes informal subdivisions based on gas productivity characteristics including the barren Ohio Creek, the stacked lenticular fluvial sandstones, sandy shales, carbonaceous shales, and coals of the Williams Fork Formation, and the underlying marine sandstones and shales of the Iles Formation. Mesaverde Group sediments are Cretaceous in age, deposited in a series of regressive marine sedimentary sequences approximately 100 to 65 million years ago (McFall et al. 1986).

The proposed drilling project would target sandstone layers within the Williams Fork (including the Cameo Coal and un-named sandstones) between 5,060 and 7,430 feet TVD. Completion of both wells will be approximately 150 feet below the top of the Rollins Sandstone Member of the Iles Formation. This well pad is located within the existing Rulison Field. The Williams Fork Formation sandstones are considered “tight” because of their low permeability reservoir characteristics. Individual sandstones are stacked and concentrated into 400-500 foot thick potentially productive sequences, and distributed throughout a vertical interval of about 3,000 feet. Studies of the Rulison Field show that these Williams Fork sandstones have limited horizontal extent, based on the lack of pressure communication between existing wells spaced less than 1,000 feet apart (Vargas 2006).

Environmental Consequences

Proposed Action

Implementation of the proposed action would result in natural gas and associated water being produced from the hydrocarbon-bearing sands within the Mesaverde Group. The amount of natural gas that may be potentially produced from the proposed wells cannot be estimated accurately. However, if the wells become productive, initial production rates would be expected to be highest during the first few years of production, then decline during the remainder of the economic lives of the wells. Natural gas production from the proposed wells would contribute to the draining of hydrocarbon-bearing reservoirs within the Mesaverde Group in this area, an action that would be consistent with BLM objectives for mineral production.

Casing programs have been designed to specifically prevent hydrocarbon migration from gas-producing strata penetrated by the well bore during drilling, initial production and after completion of the well. Identification of potential fresh water bearing zones, aquifers, gas producing zones, and under- and over-pressured formations are incorporated into drilling scenarios for the proposed wells. Estimates of what depth these zones would be encountered are used to determine drilling fluids, fluid densities, surface casing depths, and production planning. The proposed casing and cementing program has been designed to protect and isolate all usable water zones, potentially productive zones, lost circulation zones, and abnormally high-pressure zones.

The specific casing depths will vary depending on well location and drilling conditions. To accommodate protection and isolation of usable water zones, 8 5/8-inch surface casing will be set at the anticipated depth of 1,100 feet MD, well below the average depth to known aquifers and fresh water wells. Cement will be circulated to surface to assure an adequate seal between the pipe and the rock formations. The 4½-inch production casing will be set at total depth of the well and cement volumes will be sufficient to fill the annulus between the rock formations and the exterior of the casing to 200 feet above the top of the Mesaverde. If a water bearing, gas productive, lost circulation or pressured zone is encountered, cement volumes will be adjusted to isolate that zone or zones. This configuration is designed to prevent accidental contamination or leakage of hydrocarbons or fracturing fluids from reaching usable water or other productive zones within the wellbore.

No Action Alternative

Under the no action alternative, ground disturbance associated with drilling and production of the fee wells would still occur. New impacts to the geology and mineral resources would decrease, but would not be eliminated.

Noise

Affected Environment

The proposed action would lie within a rural setting characterized by fairly recent natural gas development activities. Noise levels in the area are presently created by traffic serving existing wells and by ongoing drilling and completion activities. The nearest residence is located approximately 1200 feet away, but two other drilling pads (RMV 17-27 and RMV 76-27) are closer to this residence than is the RMV 120-27 pad. Six other residences are within 0.5 mile of the pad, all on the opposite side of the Colorado River; in addition to the two above-named pads, three more pads (RMV 121-27, Juhan 14-26H, and a tank pad) are in closer proximity to most of these residences than is the RMV 120-27 pad. No residences exist along the gravel roads accessing the site from the I-70 frontage road.

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), generally a limit of 80 decibels db(A) during the day and 75 db(A) during the night, measured at a distance of 350 feet. Operations involving pipeline or gas facility installation or maintenance, the use of a drilling rig, completion rig, workover rig, or stimulation is subject to the maximum permissible noise levels for industrial zones.

Short-term (7- to 14-day) increases in noise levels would characterize road and well pad construction. Based on the Inverse Square Law of Noise Propagation (Harris 1991) and an average construction site noise level of 65 dB(A) at 500 feet (Table 5), construction noise would equal approximately 59 dB(A) at 1,000 feet. At 1,000 feet, noise levels would approximate those of an active commercial area (EPA 1974).

<i>Equipment</i>	<i>Noise Level (dB(A))</i>		
	<i>50 feet</i>	<i>500 feet</i>	<i>1,000 feet</i>
Tractor	80	60	54
Bulldozer	89	69	63
Backhoe	85	65	59
Crane	88	68	62
Air Compressor	82	62	56
Dump Truck	88	68	62
Average (rounded)	85	65	59
Source: BLM 1999b			

Noise impacts from drilling and completion activities would last approximately 45 to 60 days at each well. Noise would occur continuously, 24 hours per day, during the drilling and completion period. Based on a measured noise level of 68 dB(A) at 500 feet, actions associated with drilling and completion would generate approximately 62 dB(A) at 1,000 feet. This level of noise approximates that associated

with light industrial activities (EPA 1974). These increased noise levels would be in addition to levels of noise that are already above background levels due to current oil and gas developments in the area, and the sound of the Colorado River itself.

Traffic noise levels would also be elevated as a consequence of the proposed action. The greatest increase would be along access roads during the drilling and completion phases. Based on the La Plata County data (Table 6), approximately 68 dB(A) of noise (at 500 feet) would be created by each fuel and water truck that travels these roads. Less noise would be created by smaller trucks and passenger vehicles such as pickup trucks and sport utility vehicles. Although the duration of increased noise from this source would be short, it would occur repeatedly during the drilling and completion phases. As noted above, the nearest residence is located approximately 1,200 feet away, on the far side of the Colorado River. Since all traffic into the site would enter from I-70, the additional traffic would have minimal impact on nearby residences.

Table 6. Noise Levels Associated with Oil and Gas Production and Development				
<i>Equipment Type</i>	<i>Noise Level at 50 feet (dBA)</i>	<i>Noise Level at 500 feet (dBA)</i>	<i>Noise Level at 1000 feet (dBA)</i>	<i>Noise Level at 2000 feet (dBA)</i>
Crane	88	68	62	56
Backhoe	85	65	59	53
Pan Loader	87	67	61	55
Bulldozer	89	69	63	57
Fuel and Lubrication Truck	88	68	62	56
Water Truck	88	68	62	56
Motor Grader	85	65	59	53
Vibrator/Roller	80	60	54	48
Mechanic Truck	88	68	62	56
Flat Bed Truck	88	68	62	56
Dump Truck	88	68	62	56
Flat Bed Trailer	88	68	62	56
Tractor	80	60	54	48
Concrete Truck	86	66	60	54
Concrete Pump	82	62	56	50
Front End Loader	83	63	57	51
Road Scraper	87	67	61	55
Air Compressor	82	62	56	50
Average Construction Site	85	65	59	53
Source: La Plata County (2002)				

Noise impacts would decrease during the production phase. These levels would be less than during the construction phase, but greater than background noise levels. During maintenance and workovers, noise levels would increase above those associated with routine well production.

Traffic noise levels would impact a church located along the I-70 frontage road, which provides primary access into the area. While exposure to these noise levels is not likely to be harmful, it is likely to be

annoying to those attending activities at this church. However, the proposed action would generate only a very minor increase in overall traffic along this road, which is already lined with commercial and industrial activity.

No Action Alternative

This alternative would continue to have noise impacts if COGCC issued APDs for the four fee wells. The expected noise impacts during construction and completion would be approximately 33% less than those impacts generated by the proposed action. During the drilling and completion phase the noise levels would be equal to those of the proposed action, although they would last about 67% as long as in the proposed action since the two Federal wells would not be drilled. Noise impacts generated by maintenance truck traffic during the production phase would also be reduced by about 67% in this alternative relative to the proposed action.

Paleontology

Affected Environment

The surface formation present within the study area is Quaternary Alluvium (Qa). The RMV 120-27 well pad is underlain by lower terrace gravels of the Colorado River. Wasatch Formation sediments likely underlie the terrace gravels, but the thickness of the alluvium can be as much as 150 feet. Surface exposures of Wasatch Formation sediments are found northeast and northwest of the existing pad.

The Wasatch Formation is a BLM Class 5 formation, defined as a highly fossiliferous geologic unit that consistently and predictably produces vertebrate fossils or scientifically significant invertebrate or plant fossils, and that are at risk of human-caused adverse impacts or natural degradation. The Wasatch Formation is divided into the early Eocene Shire, and the Paleocene age Molina and Atwell Gulch Members. All members of the Wasatch Formation contain vertebrate fossils in varying abundances (Murphy and Daitch 2007). Rocks of the Wasatch Formation are lithologically very similar to one another throughout the Piceance Creek Basin as heterogeneous continental fluvial deposits with interfingering channel sandstone beds and overbank deposits consisting of variegated claystone, mudstone, and siltstone beds (Franczyk et al. 1990).

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

Environmental Consequences

Proposed Action

Construction activities have the potential to adversely affect scientifically important fossils. The greatest potential for impacts is associated with excavation of surficial materials and shallow bedrock. In general, alluvium and colluvium are much less likely to contain well preserved plant and animal remains than intact native sediments.

There are two identified fossil localities found within a 1-mile radius of the RMV 120-27 well pad, but both are located over 5,000 feet northeast, in Section 23 on Wasatch Formation sediments. The next

closest sites are located just over a mile northwest in Section 22, again found on Wasatch Formation surface sediments. Fossil discovery sites are not typically found in alluvial sediments, but can emerge as “float” material that is transported from original deposition through erosional processes and runoff.

The potential for fossil discovery is unlikely since the RMV 120-27 well pad is an existing pad and surrounding surface areas have been previously disturbed. In the event that paleontological resources are encountered, a standard paleontological COA would be attached to the APDs (Appendix A).

No Action Alternative

Under the no action alternative, drilling and production activities would still occur for the fee wells. Ground-disturbing activities would be reduced, but not eliminated. The potential to impact paleontological resources is unlikely. In the event that paleontological resources are encountered, a standard paleontological COA would be attached to the APDs (Appendix A).

Socio-Economics

Affected Environment

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

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

In 2005, oil and gas assessed valuation in Garfield County amounted to more than \$984 million or about 55 percent of total assessed value in the county. Total tax revenues from property taxes and special district levies were approximately \$87 million. Based on this assessed value, the top five taxpayers in the county in 2005 were in the “extractive” industries, including oil and gas and mining.

Federal mineral royalties are levied on oil and gas production from Federal mineral leases. For oil and gas production in Garfield County in 2003, total Federal royalties collected amounted to more than \$125 million, of which half (\$63 million) was paid to the State of Colorado. The State’s share of the revenue was then distributed to a variety of state and local agencies. Counties where oil and gas were produced received 8 percent of total revenues, local towns in those counties received 5 percent, and local school districts received 5 percent. In 2003, the Garfield County share of Federal mineral lease royalties was \$1.3 million.

Environmental Consequences

Proposed Action

The proposed action would result in a minor positive impact on the economy of Garfield County through increases in tax and royalty revenues. Additional job opportunities might also be created and supporting trades and services would benefit to a minor extent.

The proposed action could result in negative social impacts, including reduced scenic quality; increased dust levels, especially during construction; and increased traffic.

No Action Alternative

Under this alternative, minor positive economic impacts and nominal negative social impacts associated with the proposed action would not occur.

Soils

Affected Environment

According to the *Soil Survey of Rifle Area, Colorado* (USDA 1985), the proposed activities would be located entirely on Torrifluent alluvial soils. This broadly-defined soil complex is found on nearly-level floodplains adjacent to the Colorado and Roaring Fork Rivers and their tributaries. Surface texture ranges from loamy sand to clay loam; the underlying layers consist of sand, gravel, and cobbles stratified with sandy loam or loam. The water table fluctuates between depths of 2 and 4 feet, and in some years is near the surface during spring runoff. These soils are used mainly for wildlife habitat, recreation, and some grazing; erosion hazard is slight.

Environmental Consequences

Proposed Action

The site's nearly level surface, riparian vegetation buffers, and berm would minimize the potential for sediment transport into the Colorado River. Construction activities have the potential to cause a slight increase in soil loss, loss of soil productivity, and sediment transport to the Colorado River. However, the implementation of BMPs as listed in Appendix A, including restriction of construction activities outside the spring runoff season, would minimize these risks.

No Action Alternative

If COGCC issued APDs for the four fee wells planned, the resulting drilling and completion activity would still require pad expansion and possible pipeline installation; thus, this alternative would further reduce, but not eliminate, impacts to soils.

Vegetation

Affected Environment

The existing pad is located adjacent to the Colorado River. Narrowleaf cottonwood and willows are the dominant riparian species with rubber rabbitbrush dominating the drier areas. Numerous noxious weeds, such as tamarisk and Russian knapweed, are present around the vicinity of the pad.

Environmental Consequences

Proposed Action

Total short-term surface disturbance for the proposed development would be approximately 1.5 acres of private land. With implementation of reclamation practices identified in Appendix A, establishment of desirable herbaceous vegetation on the unused portions of the pad, pipeline, and road could be restored

within 2 to 3 years. The establishment of mature shrubs could take from 5 to 25 years, and the establishment of trees would take even longer. Interim reclamation would result in about a 75-percent reduction in surface disturbance of the pad that would remain over the long-term life of the project. Assuming the pad is reclaimed to the extent possible, total long-term surface disturbance associated with the proposed action would be approximately 0.52 acre of private land.

No Action Alternative

Under the no action alternative, drilling of the fee wells would still occur. The resulting impacts to vegetation would be slightly less under the no action alternative as compared to the proposed action.

The no action alternative would have the same effects as the proposed action because the drilling of the fee wells would still occur.

Visual Resources

Affected Environment

The proposed wells are located in an area that received a *Visual Resource Management (VRM) Class II* designation in the 1984 Glenwood Springs Resource Management Plan. The management objective in VRM Class II areas is to retain the existing character of the landscape. The level of change to the landscape should be low and should not be apparent to the casual observer. Changes to the landscape in Class II areas should repeat the existing form, line, color, and texture of the surrounding existing natural environment.

Every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

The extent of VRM classes, landscape character, and scenic quality on public and private lands in the high natural gas production area of Garfield County are discussed on pages 3-41 through 3-45 of the 1999 Oil and Gas Leasing & Development FSEIS. The impacts of development are discussed on pages 4-49 through 4-54 of the FSEIS. The Proposed Action would not affect any of the key viewing areas or viewsheds described therein. In particular, the Proposed Action would not be seen from the key viewing areas along the 1-70 corridor.

Despite the VRM Class II designation of the project site, the proposed action would take place on private lands, where visual resource management objectives do not apply. VRM classes shown for non-public lands are an indication of the visual values for those lands, and those values are protected only at the discretion of the private landowner.

Environmental Consequences

Proposed Action

The proposed action would result in short-term visual impacts from construction, drilling, and completion activities. The existing landscape would be changed by the introduction of new elements of line, color, form, and texture. There would be an increase in 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.

The reconstruction of the existing pad, supporting infrastructure and improved access roads will create long-term contrasts within the existing landscape by removing the existing vegetation and exposing bare ground. The visibility of new areas of surface disturbance and production equipment would increase the visual contrasts associated with human modifications in color, line, form, and texture. However, interim reclamation of the well pad would reduce some of the contrast after two to three growing seasons, and the use of natural colors on production equipment would mitigate long-term impacts (Appendix A).

Construction activities would occur over a 2- to 4-week period. Drilling and completion activities would occur 24 hours per day for a 30- to 60-day period. Consequently, the drill rig, other large equipment, lights, and well flaring would be visible in the night sky for up to two months at each well location.

No Action Alternative

Under the no action alternative, development of the fee wells would occur on private mineral estate and the BLM, therefore, would have no authority to manage visual resources and suggest possible mitigation. The private surface owner would still have discretion over the protection of the visual characteristics of the landscape.

Wildlife, Aquatic

Affected Environment

The project area is located in riparian woodland and shrubland adjacent to the Colorado River. The river contains a diversity of aquatic wildlife, including introduced sportfishes such as the rainbow trout (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta*) stocked directly into the river; introduced sportfishes such as the largemouth black bass (*Micropterus salmoides*) entering the river from reservoirs where stocked; native nongame species such as the white sucker (*Catostomus commersonii*), long-nose sucker (*C. catostomus*), mottled sculpin (*Cottus bairdi*), and speckled dace (*Rhinichthys osculus*); and a variety of non-native small minnow species transplanted from eastern Colorado streams as bait fishes.

In addition to fishes, and the BLM sensitive amphibians discussed previously under **Special Status Species** are the Woodhouse's toad (*Bufo woodhousii*) and tiger salamander (*Ambystoma tigrinum*). Tiger salamanders are generally not associated with flowing streams such as the Colorado River, but the Woodhouse's toad may breed in backwater or seasonally flooded overbank areas and venture into nearby uplands to feed.

Other aquatic wildlife in the area include myriad macroinvertebrates, including both purely aquatic forms and forms with aquatic larvae but winged terrestrial adults. Many of these taxa are an important prey base for fish as well as waterfowl, shorebirds, and some terrestrial omnivores.

Proposed Action

Environmental Consequences

Proposed Action

Although little habitat loss would occur as a result of the proposed action, the pad would be redisturbed and exposed to increased erosion potential and nearby drainages to sedimentation. Erosion and sedimentation have the potential to impact native and non-native fishes—particularly the recreationally important non-native trouts—by deposition of silt in areas of coarse gravel and cobble substrates needed for spawning of for the production of macroinvertebrate insect larvae important as a food supply.

Suspended sediment loads can reduce water quality by increasing temperature, reducing dissolved oxygen, and reducing visibility needed for effective foraging. To minimize impacts to fishes and aquatic insects in the Colorado River from inflow of sediments and chemical pollutants, mitigation measures presented in Appendix A would be attached as COAs to the APDs for the Federal wells.

No Action Alternative

Environmental Consequences

Under the no action alternative, drilling and production activities would still occur for the fee wells. Therefore, potential impacts to aquatic wildlife would be reduced but not eliminated.

Wildlife, Terrestrial

Affected Environment

Vegetation in the project area consists of narrowleaf cottonwoods and willows along the Colorado River and rabbitbrush plus weedy forbs in the upland. Scattered sagebrush and wheatgrasses provide some forage for livestock. Non-native tamarisk is common throughout the project area. This combination of species provides cover, forage, and nesting habitat for a variety of native mammals and birds, primarily in the riparian habitat. The project is located within 0.5 mile of mapped deer and elk winter range, winter concentration area, and severe winter range for mule deer (*Odocoileus hemionus*) and Rocky Mountain elk (*Cervus elaphus nelsoni*).

Environmental Consequences

Proposed Action

Direct impacts to terrestrial wildlife from the proposed action may include mortality, disturbance, nest abandonment/nesting attempt failure, or site avoidance/displacement from otherwise suitable habitats. These effects may result from increased noise from vehicles and operation of equipment, increased human presence, and collisions between wildlife and vehicles. Impacts would be more substantial during critical seasons, such as winter or during reproduction. Mule deer and elk are often restricted to smaller areas during the winter months and may expend high amounts of energy to move through snow, locate food, and maintain body temperature. Increased human use in the area, particularly during construction, drilling, and completion activities, would likely displace some animals away from preferred habitats, potentially depleting energy reserves and reducing over-winter survival.

Additional, indirect habitat loss may occur if increased human activity (e.g., traffic, noise) associated with infrastructure causes mule deer and elk to be displaced or alter their patterns of habitat use, particularly those involving movement to/from the riparian corridor. Although Federal lease COC2799 contains no special stipulations for the protection of deer and elk, the BLM can enforce COAs on individual APDs to protect important resource values, including a 60-day Timing Limitation (TL) on the use of big game winter range. However, a winter range TL would not be applied to the proposed action for two reasons: (1) the area is near, but not within, mapped winter range; (2) the GSFO does not apply a big game winter range COA to private surface when the pad is underlain by private mineral estate, with the wells drilled directionally into Federal minerals; and (3) because the majority of wells are fee and not subject to BLM jurisdiction, applying a TL to Federal wells would not preclude winter construction, drilling, and completion activities on the pad. Therefore, impacts described above could be expected for deer and elk during the critical wintering season, although these would be expected to be negligible given the small scale of the project.

No Action Alternative

Under the no action alternative, drilling and production activities would still occur for the fee wells. Therefore, potential impacts to terrestrial wildlife would be reduced but not eliminated.

SUMMARY OF CUMULATIVE IMPACTS

The *Glenwood Springs Oil and Gas Leasing and Development FSEIS* (BLM 1999) analyzed three alternatives for oil and gas development in the Glenwood Springs Resource Area. The assessment included an analysis of impacts of past, present, and reasonable foreseeable future actions, including predicted future oil and gas development, on both public and private lands. Since the FSEIS presents the most current analysis of cumulative impacts in the project area, 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 were 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 have had and would continue to have adverse effects 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 are 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 very minor, the proposed action would contribute incrementally to the collective impact to air and water quality, vegetation, migratory birds, terrestrial and aquatic wildlife, and other resources.

PERSONS AND AGENCIES CONSULTED

Williams Production Company RMT Company
U.S. Fish and Wildlife Service
U.S. Army Corps of Engineers

INTERDISCIPLINARY REVIEW

<i>Name</i>	<i>Title</i>	<i>Responsibility</i>
Vanessa Bull	Natural Resource Specialist	Team Leader, Access and Transportation, Visual Resources, Solid and Hazardous Wastes, Socio-Economics
Beth Brenneman	Ecologist	Plants, Special Status Species (Plants), Invasive Non-native Species
John Brogan	Archaeologist	Cultural Resources and Native American Concerns
Karen Conrath	Geologist	Groundwater, Paleontology, Geology and Minerals
Allen Crockett	Supervisory Natural Resource Specialist	NEPA Compliance, Document Review
Tom Fresques	Fisheries Biologist	Aquatic Wildlife, Special Status Species (Fish)
Dane Geyer	Petroleum Engineer	Downhole COAs
Richard Hanson	Wildlife Biologist	Special Status Species (Wildlife and Fish), Migratory Birds, Aquatic and Terrestrial Wildlife
Noel Ludwig	Hydrologist	Soils, Air, Surface Water, U.S. Waters, Noise, Prime Farmland, Wetlands and Riparian Zones

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

DECISION RECORD

DECISION: It is my decision to approve APDs to drill two Federal Wells on the existing RMV 120-27 fee pad. This decision will provide for the orderly, economical, and environmentally sound exploration and development of oil and gas resources on valid oil and gas leases.

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.

MITIGATION MEASURES: Mitigation measures presented in Appendices A and B will be incorporated as COAs for both surface and drilling operations.

NAME OF PREPARER: Vanessa Bull, Natural Resource Specialist/Physical Scientist

SIGNATURE OF AUTHORIZED OFFICIAL:



Supervisory Natural Resource Specialist

DATE SIGNED: July 2, 2009

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APPENDIX A

SURFACE USE CONDITIONS OF APPROVAL

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SURFACE USE CONDITIONS OF APPROVAL

STANDARD COAS APPLICABLE TO ALL ACTIVITIES IN THE AREA OF DOI-BLM-CO-N040-2009-0063 ENVIRONMENTAL ASSESSMENT (REFER TO WELL FILE RWF 423-27)

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.
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 4 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 authorized officer.
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 authorized officer 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 coffer dam 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 18 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/Gunnison Basin Regulatory Office at 970-243-1199.

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

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/Gunnison Basin Regulatory Office at 970-243-1199.

6. Wetlands and Riparian Zones. The operator shall restore temporarily disturbed wetlands or riparian areas. The operator shall consult with the BLM Glenwood Springs Energy 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. Deadline for Temporary Seeding and Interim Reclamation. Topsoil storage piles, stormwater control features, and cut-and-fill slopes shall undergo temporary seeding to stabilize the material and minimize weed infestations within 30 days following completion of construction. Interim reclamation to reduce a well pad to the maximum size needed for production shall be completed within 6 months following completion of the last well planned for the pad.

Both of these deadlines are subject to being extended upon approval of the authorized officer based on season, timing limitations, or other constraints on a case-by-case basis.

- b. Topsoil Stripping, Storage, and Replacement. Topsoil shall be stripped following removal of vegetation during construction of well pads, pipelines, roads, or other surface facilities. This shall include, at a minimum, the upper 6 inches of soil. Any additional topsoil present at a site, such as indicated by color or texture, shall also be stripped. The authorized officer may specify a stripping depth during the onsite visit. The stripped topsoil shall be stored separately from subsoil or other excavated material and replaced prior to final seedbed preparation.
- c. 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.

- d. 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 allows use of a seed mix containing sterile hybrid non-native species in addition to native perennial 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.

- e. 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. Hydroseeding and hydromulching may be used in temporary seeding or in areas where drill-seeding or broadcast-seeding/raking are impracticable. Hydroseeding and hydromulching must be conducted in two separate applications to ensure adequate contact of seeds with the soil.

If interim revegetation is unsuccessful, the operator shall implement subsequent reseeding until interim reclamation standards are met. Requirements for reseeding of unsuccessful temporary seeding will be considered on a case-by-case basis.

- f. Mulch. Mulch shall be applied within 24 hours following completion of seeding. In areas of interim reclamation that used drill-seeding or broadcast-seeding/raking, mulch shall consist of crimping certified weed-free straw or certified weed-free native grass hay into the soil. Hydromulching shall be used in areas of interim reclamation where crimping is impracticable, in areas of interim reclamation that were hydroseeded, and in areas of temporary seeding regardless of seeding method.

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

- g. 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 authorized officer. Biodegradable matting, bales, or wattles of weed-free straw or weed-free native grass hay, or well-anchored fabric silt fence shall be used on cut-and-fill slopes and along drainages to protect against soil erosion. Additional BMPs shall be employed as necessary to reduce erosion and offsite transport of sediment.
- h. 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 authorized officer will approve the type of fencing.
- i. 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 authorized officer 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 authorized officer.

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 Energy 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. 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. To reduce impacts to wintering big game, and to the extent practicable, remote sensing should be used for production monitoring, and any unavoidable monitoring or maintenance activities should be conducted between 9 a.m. and 3 p.m. These additional recommendations apply to the period from December 1 to April 30.
10. Raptor Nesting. Raptor nest surveys in the project vicinity resulted in the location of an active bald eagle nest within 0.25 mile of a well pad or 0.125 mile of an access road, pipeline, or other surface facility. To ensure compliance with the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA), the operator should schedule construction or drilling activities to begin outside the bald eagle nesting season (February 1 to July 31). If initiation of construction, drilling, or completion activities during the period cannot be avoided, the operator is responsible for complying with the MBTA, which prohibits the “take” of birds or active nests (those containing eggs or young), including nest failure caused by noise and human activity. If any construction, drilling, or completion activities or other operation of heavy equipment cannot be avoided during the period when the nest is occupied, the operator should consult with the U.S. Fish and Wildlife Service representative in the BLM Energy Office (970-947-5219) to ensure compliance with the BGEPA.
11. Migratory Birds. It shall be the responsibility of the operator to comply with the Migratory Bird Treaty Act (MBTA) with respect to “take” of migratory bird species. Under the MBTA, “take” means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The operator shall prevent use by migratory birds of any pit containing fluids associated with oil or gas operations—including but not limited to reserve pits, produced water pits, frac-water pits, cuttings trenches (if covered by water/fluid), and evaporation pits. Fluids in these pits may pose a risk to migratory birds (e.g., waterfowl, shorebirds, wading birds, songbirds, and raptors) as a result of ingestion, absorption through the skin, or interference with buoyancy and temperature regulation. Regardless of the method used, it should be employed as soon as practicable after the pit has begun receiving liquids. At a minimum, the method 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 Energy Office at 970-947-5219 and visit <http://www.fws.gov/mountain-prairie/contaminants/oilpits.htm>.
12. Birds of Conservation Concern. Pursuant to BLM Instruction Memorandum 2008-050, all surface-disturbing activities are prohibited from May 1 to July 1 to reduce impacts to Birds of Conservation Concern (BCC). An exception to this COA will be granted if nesting surveys conducted no more than one week prior to surface-disturbing activities indicate that no BCC species are nesting or otherwise present within 10 meters of the area to be disturbed. Nesting surveys shall include an aural survey for diagnostic vocalizations in conjunction with a visual survey for adults and nests. Surveys shall be conducted by a qualified breeding bird surveyor between sunrise and 10:00 AM under favorable conditions for detecting and identifying a BCC species. This provision does not

apply to ongoing construction, drilling, or completion activities that are initiated prior to May 1 and continue into the 60-day period at the same location.

13. 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.
14. 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.
15. 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 authorized officer of the findings. The discovery must be protected until notified to proceed by the BLM authorized officer.

Where feasible, the operator shall suspend ground-disturbing activities at the discovery site and immediately notify the BLM authorized officer of any finds. The BLM authorized officer 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.

16. 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 authorized officer 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 authorized officer 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 authorized officer 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 authorized officer. Approval to proceed will be based upon evaluation of the resource. Evaluation shall be by a qualified professional selected by the BLM authorized officer 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 authorized officer 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 authorized officer 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 authorized officer 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 authorized officer will provide technical and procedural guidelines for relocation and/or to conduct mitigation. Upon verification from the BLM authorized officer 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).

17. Visual Resources. To the extent practicable, existing vegetation shall be preserved when clearing and grading for pads, roads, and pipelines. The authorized officer 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 of Federal facilities shall be Covert Green. BLM recommends that private facilities be painted the same color. The requirement for Covert Green will be attached as a COA to the individual APDs issued pursuant to this EA.

SITE-SPECIFIC COAS APPLICABLE TO THE RMV 120-27 WELL PAD AND FACILITIES

1. To the maximum extent feasible, cuttings from the RMV 120-27 shall be hauled to a remote site outside the 100-year floodplain of the Colorado River for final disposal.
2. The reserve pit shall be lined with an impermeable plastic liner. 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. The reserve pit is not expected to contain fluids. However, if a change in operation results in fluids being accumulated and retained in the reserve pit, the pit shall be netted to lower the risk to migratory birds.

3. During well completions, fluids shall flowback to tanks rather than to a pit.
4. Drilling and well completion shall occur outside the period when the nearby eagle nest is occupied by fledglings, and outside the period of spring runoff in the Colorado River.
5. The reserve pit shall be reclaimed as soon as possible after drilling, and before high water the following spring.
6. All tanks, including the existing production tanks, shall be surrounded by steel containment rings.
7. The well pad and access road shall be constructed to avoid additional water impoundment.
8. If approved by the landowner, the operator shall plant an appropriate seed mix during interim reclamation to reestablish vegetation characteristics similar to pre-construction habitat conditions onsite.
9. Flow lines shall be buried to avoid potential breakage, and shall be periodically pressure tested to prevent leakage.
10. During the production phase, remote telemetry shall be used to monitor wells and tanks.
11. Water quality shall be periodically tested in the 5-acre, donut-shaped pond southwest of the pad site. Sampling shall test for diesel-range and gasoline-range hydrocarbons, and results shall be promptly reported to the BLM, the USFWS, and the private landowner. Water samples shall be collected at two locations in this pond and shall be collected at the water surface to a maximum depth of 3 inches. Samples shall be taken on four separate occasions: (1) prior to pad construction, (2) during well drilling, (3) during well completion, and (4) no later than one month following completion of all wells. Additional sampling shall be conducted immediately following any future workover operations.

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APPENDIX B

DOWNHOLE CONDITIONS OF APPROVAL

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DOWNHOLE CONDITIONS OF APPROVAL

Applications for Permit to Drill

Company/Operator: Williams Production RMT Company

Surface Location: SWNE, Section 27, Township 6 South, Range 94 West, 6th P.M.

<u>Well Name</u>	<u>Well No.</u>	<u>Bottomhole Location</u>	<u>Lease</u>
RWF	32-27	SWNE Sec. 27, T. 6S., R. 94W.	COC2799
RWF	432-27	SWNE Sec. 27, T. 6S., R. 94W.	COC2799

1. Twenty-four hours *prior* to (a) spudding, (b) conducting BOPE tests, (c) running casing strings, and (d) within twenty-four hours *after* spudding, the GSEO shall be notified. One of the following GSEO's inspectors shall be notified by phone: Steve Ficklin at 970-947-5213, Julie King shall at 970-947-5239, and Todd Sieber at 970-947-5220.
2. A GSEO petroleum engineer shall be contacted for a verbal approval prior to commencing remedial work, plugging operations on newly drilled boreholes, changes within the drilling plan, changes or variances to the BOPE, deviating from conditions of approval, and conducting other operations not specified within the APD. Contact Dane Geyer at 970-947-5229 (office) or 970-589-6887 (cell) for verbal approvals. As a secondary contact, Bob Hartman may be contacted at 970-244-3041 (office) or 970-250-7002 (cell).
3. If a well control issue arises (e.g. kick, blowout, or water flow), casing failure occurs, or an increase in bradenhead pressure occurs during fracturing operations, Dane Geyer shall be notified within 24 hours from the time of the event.
4. The BOPE shall be tested and conform to Onshore Order #2 for a **3M** system.
5. A casinghead rated to 3,000 psi or greater shall be utilized.
6. An electrical/mechanical mud monitoring equipment shall be functional prior to drilling out the next shoe. As a minimum, this shall include a pit volume totalizer, stroke counter, and flow sensor.
7. Gas detecting equipment shall be installed in the mud return system, prior to drilling out the next shoe, and hydrocarbon gas shall be monitored for pore pressure changes.
8. A gas buster shall be functional and all flare lines effectively anchored in place, prior to drilling out the next shoe. The discharge of the flare lines shall be a minimum of 100 feet from the well head and targeted at bends. The panic line shall be a separate line (not open inside the buffer tank) and effectively anchored. All lines shall be downwind of the prevailing wind direction and directed into a flare pit, which cannot be the reserve pit. The flare system shall use an automatic ignition. Where noncombustible gas is likely or expected to be vented, the system shall be provided supplemental fuel for ignition and maintain a continuous flare.
9. Prior to commencing fracturing operations, the production casing shall be tested to the maximum anticipated surface fracture pressure and held for 15 minutes. If leak-off is found, Dane Geyer shall

be notified within 24 hours of the failed test, but prior to proceeding with fracturing operations. The test shall be charted and set to a time increment as to take up no less than a quarter of the chart per test. The chart shall be submitted with the well completion report.

10. As a minimum, cement shall be brought to 200 feet above the Mesaverde. Prior to commencing fracturing operations, a CBL shall be run (from TD to 200 feet above the TOC) and an electronic copy submitted to the GSEO. If the TOC is lower than required or the cement sheath of poor quality, then, within 48 hours from running the CBL and prior to commencing fracturing operations, a GSEO petroleum engineer shall be notified for further instruction.
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) Formation Integrity Test results with the well completion report. Contact Dane Geyer for clarification.

EPA'S LIST OF NONEXEMPT EXPLORATION AND PRODUCTION WASTES

While the following wastes are nonexempt, they are not necessarily hazardous.

- Unused fracturing fluids or acids
- Gas plant cooling tower cleaning wastes
- Painting wastes
- Oil and gas service company wastes, such as empty drums, drum rinsate, vacuum truck rinsate, sandblast media, painting wastes, spent solvents, spilled chemicals, and waste acids
- Vacuum truck and drum rinsate from trucks and drums, transporting or containing nonexempt waste
- Refinery wastes
- Liquid and solid wastes generated by crude oil and tank bottom reclaimers
- Used equipment lubrication oils
- Waste compressor oil, filters, and blowdown
- Used hydraulic fluids
- Waste solvents
- Waste in transportation pipeline-related pits
- Caustic or acid cleaners
- Boiler cleaning wastes
- Boiler refractory bricks
- Incinerator ash
- Laboratory wastes
- Sanitary wastes
- Pesticide wastes
- Radioactive tracer wastes
- Drums, insulation, and miscellaneous solids

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APPENDIX C

USFWS CONCURRENCE LETTER

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
764 Horizon Drive, Building B
Grand Junction, Colorado 81506-3946

IN REPLY REFER TO:
ES/CO: BLM/GSEO
TAILS 65413-2009-I-0074

RECEIVED
JUN 22 2009
BY: _____

June 19, 2009

Memorandum

To: Supervisory Natural Resource Specialist, Bureau of Land Management, Glenwood Springs Energy Office, Glenwood Springs, Colorado

From: Acting Western Colorado Supervisor, Fish and Wildlife Service, Ecological Services, Grand Junction, Colorado
Allan R. Pfeiffer

Subject: Natural Gas Well Drilling by William's Production RMT Company on Pad RMV 120-27

This responds to your correspondence, which was received in our office on May 26, 2009, regarding a permit to drill natural gas wells by William's Production RMT Company (Williams) on the existing pad RMV 120-27. You have determined that the drilling, completion, and production activities at this site may affect the federally endangered Colorado pikeminnow (*Ptychocheilus lucius*) and razorback sucker (*Xyrauchen texanus*) and their critical habitats.

The RMV 120-27 pad is located within the 100-year floodplain of the Colorado River in T. 6 S., R. 94 W., section 27, approximately 6 miles downstream from the Town of Rifle in Garfield County, Colorado. Critical habitat has been designated within the 100-year floodplain of the Colorado River downstream of the town of Rifle for both the Colorado pikeminnow and razorback sucker. The surface of this property is privately owned. Williams proposes to directionally drill six wells from this pad, two of which would access Federal minerals managed by the Bureau of Land Management (BLM).

No Colorado pikeminnow or razorback suckers have been found within the past two decades as far up the Colorado River as the 120-27 pad. However, one mature razorback sucker was electro-shocked and removed from a pond adjacent to the 120-27 pad in 1991 (apparently the doughnut-shaped pond). Currently both endangered fish species are known to reside in the Colorado River below the Price-Stubb Dam just above the town of Palisade. One Colorado pikeminnow has been found this year above the Price-Stubb Dam, but none yet above the Grand Valley Project Diversion Dam (GVPDD) which provides water to the Government Highline Canal. The GVPDD is approximately 37 miles downstream from the 120-27 pad.

Given that neither the Colorado pikeminnow nor the razorback sucker are currently known to occupy the Colorado River in the vicinity of the 120-27 pad, the focus of our analysis is on the effects of the project on critical habitat designated for these fish. Capture records indicate that the

De Beque-to-Rifle reach of the Colorado River has provided important habitat, at least to razorback suckers, in the past (Osmundson 2001). Also, since fish passage has recently been restored to the GVPDD and Price-Stubb Dam, this reach may once again become regularly occupied by one or both of these endangered fish.

The extraction of natural gas from within endangered fish critical habitat poses two primary risks—loss of floodplain habitat and the introduction of hazardous materials. The loss of floodplain habitat, which is seasonally important for both young and adult fish, can occur through the removal of native vegetation or a change to floodplain hydrogeomorphology via the construction of roads, berms, or other barriers to floodwater inundation. Hazardous materials are used in both the natural gas drilling and completion process, and are brought to the surface during production. Although various containment methods are used to prevent the release of pollutants into the natural environment, accidents and spills sometimes occur.

We concur with your determination that the proposed project is not likely to adversely affect the Colorado pikeminnow, razorback sucker, or their critical habitats based on project description and conservation measures outlined in the biological assessment (BA) (BLM 2009a). Some of more relevant details include:

- 1) The wells would be drilled from an existing pad. Although the existing pad would need to be reconfigured and enlarged somewhat, the site has been previously disturbed.
- 2) No new roads will be developed. No dikes or other barriers to floodwater movement would be constructed. No water impoundments would be allowed.
- 3) The on-site drill cuttings trench would be lined. It would also be constructed so that the cuttings could be removed.
- 4) Most or all of the drill cuttings would be removed and hauled to a remote cuttings trench outside of the 100-year floodplain.
- 5) All fluids used for fracing and produced during well completions would be contained within tanks. Once the wells are completed, all flow-back fluids and produced water would be removed from the site and disposed of outside of the 100-year floodplain.
- 6) The cuttings pit would be closed and reclaimed as soon as possible after drilling and completion, rather than left open to evaporate residual liquids. Pit closure is planned to occur prior to December 1st of this year.
- 7) Production storage tanks will be placed within a lined, secondary steel containment structure.
- 8) All flow lines from well head to production equipment would be buried to avoid potential breakage and would be periodically pressure-tested to ensure against leaks.
- 9) Water quality sampling would be conducted in the pond adjacent to the RMV 120-27 pad. This "doughnut-shaped" pond is down-gradient from the pad. Sampling will include

pre-construction baseline, during drilling, and post-completion sampling. At a minimum, Williams will sample for total petroleum hydrocarbons and for benzene, toluene, ethylbenzene, and xylene (BTEX). All sample results would be provided to the Service and BLM.

- 10) Williams will have in-place an Emergency Response Plan and on-going spill prevention, control, and countermeasure plans (SPCC) in place prior to commencement of any drilling or production operations. These plans include very specific procedures to mitigate any resulting spills.
- 11) Drilling and completion would not take place during high flows in the Colorado River. Thus, the potential for flooding during drilling and completion is very remote.
- 12) Vegetation reclamation would replace existing vegetation removed during construction. The loss of existing vegetation for pad reconfiguration is small and very minor relative to the total potential habitat in the 100-year floodplain in the immediate area. The loss of mature woody vegetation, such as cottonwood trees, would be minimized or avoided.
- 13) No Colorado pikeminnow or razorback sucker are currently known to reside in the vicinity of the RMV 120-27 pad. They are known to exist approximately 40 miles downstream in the Colorado River. Any pollutants escaping from the project site and transported to river reaches occupied by these fish would become very diluted before reaching them. However, it is important to note that fish passage was completed for the Price-Stubb Dam just above the town of Palisade last year. Fish can now pass above this structure, which had been a barrier to upstream movement since 1911. Endangered fish are expected to move upriver and eventually occupy historic habitat in the Colorado River, perhaps up to the project site.
- 14) All other conservation and avoidance measures outlined in the BA (BLM 2009).

If new information becomes available, new species are listed, or should there be any material changes to the project and its anticipated impact that may affect any endangered or threatened species in a manner or to an extent not considered in the proposed action, section 7 consultation should be reinitiated. Additionally, if water quality sampling indicates that contaminants are escaping the pad and entering surface waters, we should be contacted to determine whether or not section 7 consultation should be reinitiated and to discuss appropriate clean-up and remediation measures.

If the Service can be of further assistance, please contact Creed Clayton at (970) 947-5219.

References

- Bureau of Land Management. 2009. Biological Assessment for Endangered Fish Species, Williams Production RMT Company, Existing RMV120-27 Well Pad. Prepared by WestWater Engineering for the Glenwood Springs BLM Field Office. May 2009.
- Osmundson, D.B. 2001. Flow regimes for restoration and maintenance of sufficient habitat to recover endangered razorback sucker and Colorado pikeminnow in the upper Colorado River: interim recommendations for the Palisade-to-Rifle reach. Final Report. Recovery Implementation Program Project No. 74, U.S. Fish and Wildlife Service.