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

ENVIRONMENTAL ASSESSMENT

NUMBER: CO140-2008-142 EA

CASEFILE NUMBER: Federal Lease COC51146

PROJECT NAME: Application for Permit to Drill four Federal wells from one well pad (Jolley 1C-17) located on private surface in the Jolley Mesa area approximately 4 air miles southeast of Silt, Garfield County, Colorado.

LOCATION: SE¼SW¼, section 17, Township 6 South, Range 91 West, 6th Principal Meridian.

LEGAL DESCRIPTIONS:

Table 1. Surface and Bottomhole Locations of Proposed Federal Wells

Proposed Wells	*Surface Locations*	*Bottomhole Locations*
Kokopelli Federal 17-113D	622' FSL, 1886' FWL Section 17, T6S R91W	1146' FSL, 660' FWL, Section 17, T6S R91W
Kokopelli Federal 17-114D	623' FSL, 1866' FWL Section 17, T6S R91W	814' FSL, 660' FWL Section 17, T6S R91W
Kokopelli Federal 17-115D	613' FSL, 1866' FWL Section 17, T6S R91W	482' FSL, 660' FWL Section 17, T6S R91W
Kokopelli Federal 17-116D	612' FSL, 1886' FWL Section 17, T6S R91W	150' FSL, 660' FWL Section 17, T6S R91W

APPLICANT: Orion Energy Partners, LLC (Orion)

DESCRIPTION OF THE PROPOSED ACTION AND NO ACTION ALTERNATIVE

Proposed Action

The proposed action is to drill and develop four Federal oil and gas wells from an existing well pad (Jolley 1C-17) on private lands (Figure 1). The wells would be directionally drilled from the proposed location into Federal mineral estate. In addition, there are five fee wells proposed for drilling from this location.

The proposed project area is located 4 air-miles southeast of Silt, Colorado. Access from the frontage road at the south end of the Silt I-70 interchange, proceed in a general easterly direction along said

frontage road 0.4 miles to the intersection with county road 311 on the right, proceed right in a general southerly direction along county road 311 crossing the Colorado River 0.6 miles to the intersection with county road 331, proceed left in a general easterly direction continuing along county road 311 for 1.4 miles to the intersection with county road 335, proceed in a general easterly direction along county road 335 for 1.1 miles to an existing gravel pit on the right, proceed right in a general southeasterly direction along an existing gravel road 0.8 miles to a 'Y' intersection, proceed left in a general easterly direction for 1.6 miles to an intersection with a dirt/gravel road on the left, proceed left in a general easterly direction for 0.1 miles to the existing Jolley 1C-17 well pad.

The proposed action would incorporate a location where a producing fee gas well was drilled in 2000. The reconstructed pad would be approximately 400 feet x 240 feet and would disturb approximately 2.96 acres, which would be reduced to approximately 0.9 acres after interim reclamation. A short segment of gas pipeline will be installed south from the pad to the existing pipeline situated within the access road to the neighboring 17-4 pad, which will be entirely reclaimed following installation.

Main access Roads are in place and 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 9113- *Roads Manual* or as determined by the private land owner.

The proposed action would include drilling and completion operations, production of natural gas, pipelines, and intermediate and final reclamation measures. Production equipment (tanks, separators, wellheads, metering, remote monitoring equipment, combustion unit, produced water pump, etc.) would be installed on the pad.

The proposed action would be implemented consistent with Federal oil and gas leases COC51146, 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.

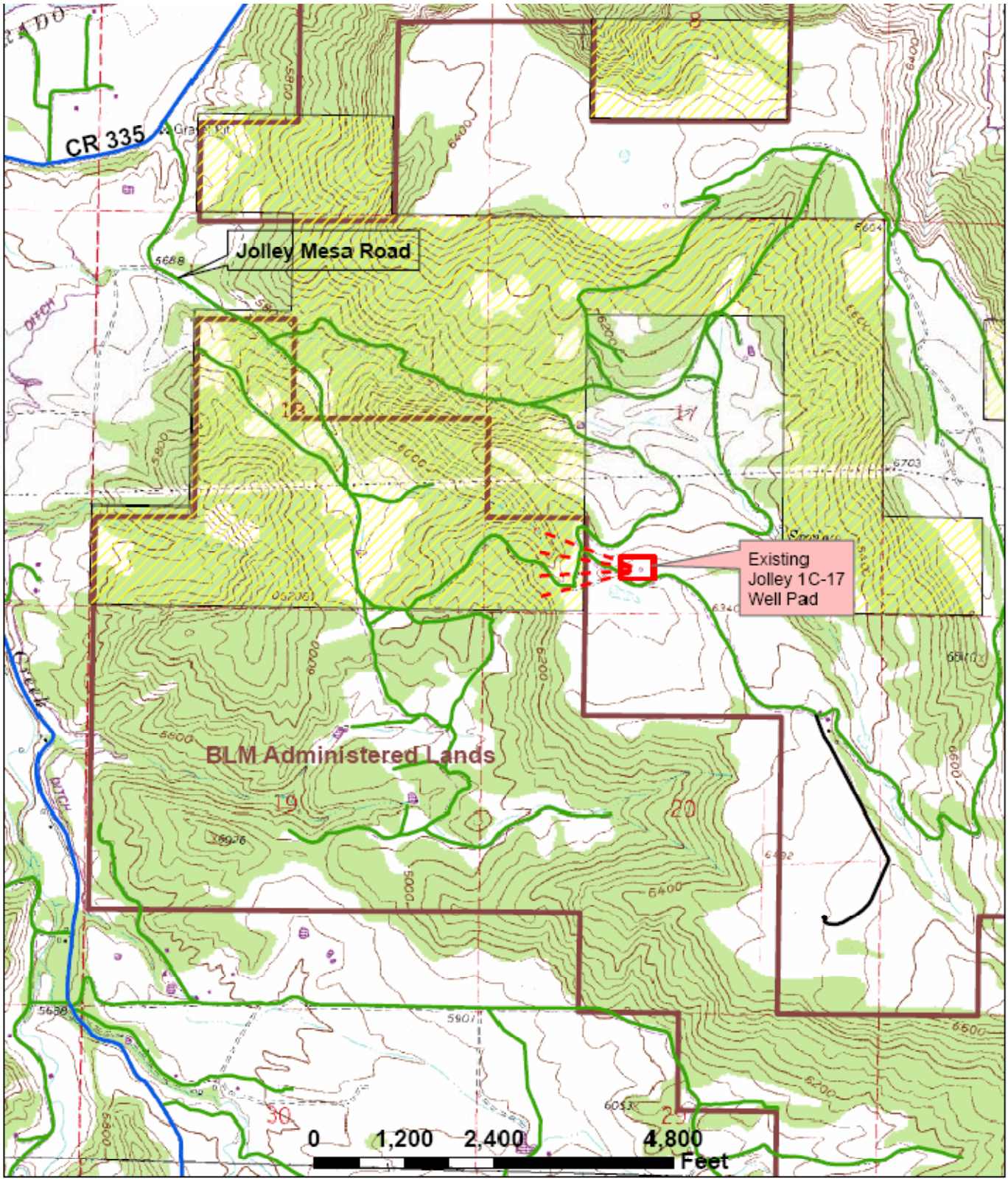
No Action Alternative

The proposed action involves Federal subsurface minerals that are leased. These Federal leases grant the lessee the right to explore and develop the lease. Although BLM cannot deny the right to drill and develop the leasehold, individual APDs can be denied to prevent unnecessary and undue degradation. The no action alternative constitutes denial of the APDs associated with the proposed action.

Under the no action alternative, the APDs associated with the proposed action would be denied and the four Federal wells would not be developed. However, the access road and well pad are located on private surface underlain by private minerals and Federal authorization is not required prior to development of the private lease. Therefore, it is likely that the existing well pad would be expanded, and the five fee wells developed even if the Federal APDs are denied.

PURPOSE AND NEED FOR THE ACTION

The purpose of the action is to develop oil and gas resources on Federal Lease COC51146 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.



Orion Energy Partners LP
Well Pad Location: T6S, R91W, Section 17, 6th PM, Garfield County, Colorado
Surface Owner: Private

Lease COC-51146

Figure 1. Project Area

SUMMARY OF LEASE STIPULATIONS

Federal Lease COC51146 contains special stipulations applicable to the proposed action (Table 2).

Table 2. Lease Stipulations Applicable to the Proposed Action		
Lease Number	***Description of Lands***	***Lease Stipulations***
COC51146	All lands	**Timing Limitation:** No surface use is allowed during the following time period (1/16 – 4/29). This stipulation does not apply to operation and maintenance of production facilities. For the purpose of: To minimize watershed damage and to protect important seasonal wildlife habitat.

Although Federal Lease COC 51146 contains a winter timing limitation (TL) from January 16 through April 29, this stipulation does not apply to the Federal wells drilled from this private land pad. The basis for this is that the surface location is privately owned and private mineral estate development is occurring on this location and limiting the directional drilling of federal wells would have minimal benefit to the watershed and big game.

PLAN CONFORMANCE REVIEW

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

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

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

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

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

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

STANDARDS FOR PUBLIC LAND HEALTH

In January 1997, Colorado BLM approved the Standards for Public Land Health. The five standards cover upland soils, riparian systems, plant and animal communities, threatened and endangered species,

and water quality. Standards describe conditions needed to sustain public land health and relate to all uses of the public lands. 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 South LHA. At this time, the landscape addressed in this EA has not had a formal Land Health Assessment completed. As such, no formal determination on conformance with Standards will be made until a formal Land Health Assessment and Determination Document is completed.

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. Not all of the critical elements that require inclusion in this EA are present, or if they are present, may not be affected by the proposed action and alternative (Table 3). Only those mandatory critical elements that are present and affected are described in the following narrative.

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.**

Table 3. Critical Elements of the Human Environment

Critical Element	*Present*		*Affected*		*Critical Element*	*Present*		*Affected*	
	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

Critical Elements

Air Quality

Affected Environment

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

Environmental Consequences

Proposed Action

The Roan Plateau RMPA and EIS describe potential effects from oil and gas development (BLM 2006:4-26 to 4-37). Analysis was completed with regard to greenhouse gas emissions, a near-field and far-field analysis for carbon monoxide, particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide, and hazardous air pollutants including: benzene, ethylbenzene, formaldehyde, hydrogen sulfide, toluene, and xylenes. Sulfur and nitrogen deposition analysis, acid neutralizing capacity, and visibility screening-level analysis were also completed in the Roan Plateau RMPA and EIS. Findings indicate that no adverse long-term effects would result under that plan. Since the proposed action is within the scope of the reasonable foreseeable development (RFD) scenario analyzed in that document, it is anticipated that the proposed action would be unlikely to have adverse impacts on air quality.

Activities described in the proposed action would result in localized short-term increases in vehicle and equipment emissions. Concentrations of emissions would be below applicable ambient air quality standards as analyzed in the Roan Plateau RMPA & EIS. However, it is anticipated that construction and production activities would likely produce high levels of dust in dry conditions without dust abatement. To mitigate dust generated by these activities, the operator would be required to implement dust abatement strategies by watering the access road and construction areas as needed and/or by applying a surfactant approved by the Authorized Officer (Appendix A).

No Action Alternative

The no action alternative would have comparable impact on air quality, via dust generation and equipment emissions, as the proposed action. The construction phase would have an equal impact on air quality as the proposed action, since the pad would still be re-constructed. During the production phase, potential impacts on air quality would be reduced slightly since half of the wells in the proposed action would not be drilled.

Cultural Resources

Affected Environment

A Class III cultural resource inventory (GSFO # 16108-1) was conducted for the Kokopelli MDP and included this pad location. No properties were identified in this project area that were considered eligible for listing on the National Register of Historic Places. 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 (NRHP), as

amended (16 USC 470f), National BLM/SHPO Programmatic Agreement (1997), and Colorado Protocol (1998).

Environmental Consequences

Proposed Action

There would be no direct impacts to cultural resources 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 location. These impacts could range from illegal collection and excavation to vandalism.

A standard Education/Discovery Condition of Approval (COA) for cultural resource protection would be attached to the APD(s) (Appendix A). The importance of this COA should be stressed to operator 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 four federal wells would not be drilled, though the pad and proposed access road would still be upgraded for the five proposed fee wells. Therefore, virtually the same direct impacts as described for the proposed action would occur without the mitigation measures, and cultural resources in the general area would remain vulnerable to damage from illegal activities. The standard Education/Discovery COA for cultural resource protection would not be attached to the permit, though the Colorado State Statute CRS 24-80-1301 for Historic, Prehistoric, and Archaeological Resources, and for Unmarked Human Graves would apply.

Invasive Non-native Species

Affected Environment

The existing pad lies adjacent to juniper woodland (*Juniperus osteosperma*) interspersed with Wyoming big sagebrush (*Artemisia tridentata subsp. wyomingensis*). The pad is currently in a state of interim reclamation and seeded grasses are present around the perimeter. Numerous non-native species are present in the area such as cheatgrass (*Anisantha tectorum*) and tumble mustard (*Sisymbrium altissimum*).

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 well APDs as conditions of approval (see Appendix A).

No Action Alternative

Under the no action alternative, it is likely the pad, road and five fee wells would be developed to access private minerals. Therefore, the no action alternative would increase the risk of noxious weed invasion. Mitigation of this risk would be undertaken at the landowner's discretion.

Migratory Birds

Affected Environment

The project area provides cover, forage, and nesting habitat for a variety of migratory birds. A few species found on the U.S. Fish and Wildlife Service's Birds of Conservation Concern (USFWS 2002) may be present. These species are the pinyon jay (*Gymnorhinus cyanocephalus*), gray vireo (*Vireo vicinior*), black-throated gray warbler (*Dendroica nigrescens*), and Virginia's warbler (*Vermivora virginiae*). Other species that are not on the BCC list but associated primarily with this habitat type include year-round residents such as the juniper titmouse (*Baeolophus griseus*) and Townsend's solitaire (*Myadestes townsendi*) and migrants such as the blue-gray gnatcatcher (*Polioptila caerulea*). The pinyon/juniper habitat provides perching, foraging, and potential nesting sites for several species, including one species on the BCC list, Swainson's hawk (*Buteo swainsoni*).

Surveys conducted in 2008 did not locate raptor nests within 0.25 mile of the proposed well pad or 0.125 mile of the proposed road or pipeline. However, golden eagles (*Aquila chrysaetos*) and red-tailed hawks (*Buteo jamaicensis*) are known to nest in the vicinity. It is likely that these and other raptors forage in the area where the new well pad, road, and pipeline facilities would be developed.

Other raptors potentially using the pinyon-juniper habitat for perching or nesting include the Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*A. striatus*), and two small owls, the western screech-owl (*Otus kennicottii*) and northern pygmy-owl (*Glaucidium gnoma*). All of the raptors and other species listed above are protected by the Migratory Bird Treaty Act.

Environmental Consequences

Proposed Action

The proposed action would result in 2.96 acres of disturbance, the majority of which was previously disturbed for exploratory development in 2000. This area would again undergo interim reclamation following well development at which time the total disturbed area would be reduced to approximately 0.9 acres. Therefore very little suitable habitat would be directly affected. The greatest potential for affecting migratory birds as a result of the proposed action occurs indirectly through noise and human activity. It is possible that during construction, drilling, and completion activities individual birds could be temporarily displaced to avoid disturbance. This impact would diminish during the production phase when disturbance would be limited vehicle traffic a few times per week. Despite the potential impacts to individual birds, it is unlikely that birds would be affected at the population. Raptors should not be negatively affected as no nests are known to occur within 0.25 mile of the pad and upland foraging habitat is plentiful in the area. A raptor nesting Condition of Approval is included in Appendix A.

The development of a reserve pit and frac pit on the proposed pad may be expected to attract waterfowl and other migratory birds for the purposes of resting, foraging, or as a source of water. The extent and nature of the problem is not well-defined, but management measures should be aimed at preventing bird contact with produced water and drilling and completion fluids that may pose a problem (e.g., acute or chronic toxicity, compromised insulation). Mitigation measures designed to limit access to reserve pits are presented in Appendix A.

No Action Alternative

Under the no action alternative, the APDs associated with the proposed action would be denied and the four Federal wells would not be developed. However, the access road and well pad are located on private

surface underlain by private minerals and Federal authorization is not required prior to development of the private lease. Therefore, it is likely that the existing well pad would be expanded and the five fee wells developed even if the Federal APDs are denied. As such, impacts similar to those described under the proposed action could be expected.

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 GSFO, 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 Condition of Approval (COA) for the protection of Native American values would be attached to the APDs (Appendix A). The importance of these COAs should be stressed to the operator and its contractors, including informing them of their responsibilities to protect and report any cultural resources encountered.

No Action Alternative

The impacts of the no action alternative would be the same as the proposed action. The standard Education/Discovery COA for cultural resource protection would not be attached to the permit, though the Colorado State Statute CRS 24-80-1301 for Historic, Prehistoric, and Archaeological Resources, and for Unmarked Human Graves would apply.

Special Status Species (includes an analysis of Public Land Health Standard 4)

Affected Environment

Federally Listed, Proposed, or Candidate Plant Species

According to the latest species list from the U. S. Fish and Wildlife Service (USFWS) (http://mountain-prairie.fws.gov/endspp/CountyLists/COLORADO.pdf), the following Federally listed, proposed, or candidate plant species may occur within or be impacted by actions occurring in Garfield County: Uinta Basin hookless cactus (*Sclerocactus glaucus*), Parachute beardtongue (*Penstemon debilis*), and DeBeque phacelia (*Phacelia submutica*).

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 project area contains no BLM sensitive plant species or suitable habitat for these species.

Federally Listed, Proposed, or Candidate Animal Species

According to the latest species list from USFWS (http://mountain-prairie.fws.gov.endspp/CountyLists/COLORADO.pdf), the following federally listed, proposed, or candidate animal species may occur within or be impacted by actions occurring in Garfield County, Colorado: Canada lynx (*Lynx canadensis*), Mexican spotted owl (*Strix occidentalis lucida*), yellow-billed cuckoo (*Coccyzus americanus*), bonytail chub (*Gila elegans*), humpback chub (*Gila cypha*), razorback sucker (*Xyrauchen texanus*), and Colorado pikeminnow (*Ptychocheilus lucius*). The bald eagle (*Haliaeetus leucocephalus*) was removed from the list of threatened or endangered species in August 2007. The BLM now considers the bald eagle a sensitive species.

BLM Sensitive Animal Species

BLM sensitive animal species with habitat and/or occurrence records in the area include bald eagle (*Haliaeetus leucocephalus*), milk snake (*Lampropeltis triangulum taylori*), midget faded rattlesnake (*Crotalus viridis concolor*), and Great Basin spadefoot (*Spea intermontana*). In addition, four BLM sensitive fish species—the flannelmouth sucker (*Catostomus latipinnis*), bluehead sucker (*Catostomus discobolus*), roundtail chub (*Gila robusta*), and Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*)—are known to inhabit the Colorado River.

Environmental Consequences

Proposed Action

Federally Listed, Proposed, or Candidate Plant Species

The project area contains no federally listed, proposed, or candidate plant species or suitable habitat for these species. Therefore, the proposed action would have "**No Effect**" on these species.

BLM Sensitive Plant Species

The project area contains no BLM sensitive plant species or suitable habitat for these species in the vicinity of the proposed action.

Federally Listed, Proposed, or Candidate Animal Species

With the exception of listed fish species, habitat for federally listed, proposed, or candidate animal species does not occur within or adjacent to the project area. Therefore, the proposed action would have **"No Effect"** on these species.

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 not likely 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.

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.

As part of a Programmatic Biological Opinion (BO) issued in 1994, the USFWS determined that any depletion of flows in the Colorado River Basin represent a "**May Affect, Likely to Adversely Affect**" determination for individual projects. The Programmatic BO, which allows BLM to authorize projects with water depletions of less than 125 acre-feet per year, was written to remain in effect until a total depletion threshold of 2,900 acre-feet per year is reached. An amendment to that BO in 2000 revised the threshold to 3,000 acre-feet per year. The BLM and USFWS are currently nearing completion of a new BO to cover anticipated additional depletions beyond the currently specified threshold. In the meantime, depletions associated with the current project would be well below the 125 acre-feet threshold for individual projects and within the current BO.

BLM Sensitive Animal Species

The Colorado River corridor provides bald eagle nesting and winter foraging and roosting habitat. However, the Colorado River is greater than one mile from the project area, beyond the distance within which impacts to nesting or wintering bald eagles may be expected to occur. In addition to distance, the proposed developments are screened from the Colorado River by topographic features. Therefore, no impacts to bald eagle are expected.

Direct impacts to the BLM sensitive reptile and amphibian species could include injury or mortality as a result of proposed developments and subsequent production and maintenance activities. These effects would be most likely during the active season for these species, which are April to October for the milk snake, March to October for the midget faded rattlesnake, and May through September for the Great Basin spadefoot. Indirect effects to the milk snake and midget faded rattlesnake could include a greater susceptibility to predation if the roads or pads are used to aid in temperature regulation. Overall, however, there is a low likelihood that these species would be measurably affected.

Well pad construction would disturb soil and remove vegetation, increasing the potential for erosion and increased sedimentation to the Colorado River. Although Colorado River cutthroat trout are especially sensitive to increased sediment loads that can potentially impair preferred spawning habitats, the Colorado River is not considered spawning habitat. Sediment may reduce aquatic insect productivity that could impact food resources for trout and other wildlife. However, given that high sediment loads occur naturally, any change in productivity would likely be undetectable.

The discussion of potential impacts described above for the endangered Colorado River fishes is also relevant to the nongame fishes listed as sensitive by the BLM. Because mitigation measures would be implemented (Appendix A), it is unlikely that the proposed action would cause unnatural sediment loads in nearby streams, including the Colorado River. Depletions in flow volumes would also not be of a magnitude that would affect the BLM sensitive fish species. Therefore, no discernible impacts to these species are expected.

No Action Alternative

Federally Listed, Proposed, or Candidate Plant Species

The no action alternative would not cause impacts to any federally listed, proposed, or candidate plants because these species do not occur in the area to be affected.

BLM Sensitive Plant Species

The no action alternative would not cause impacts to any BLM sensitive 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 APDs associated with the proposed action would be denied and the four Federal wells would not be developed. However, the access road and well pad are located on private surface underlain by private minerals and Federal authorization is not required prior to development of the private lease. Therefore, it is likely that the existing well pad would be expanded and the five fee wells developed even if the Federal APDs are denied. As such, impacts similar to those described under the proposed action could be expected.

Analysis on the Public Land Health Standard for Special Status Species

A formal Land Health Assessment has not been completed for the project area watershed. The proposed action in conjunction with similar activity occurring in the greater watershed is likely trending the area downward as habitat is lost and fragmented and human use is increased in the area. As no offsite or indirect impacts are anticipated if the COAs are implemented, the proposed action should have no effect on special status species. The proposed action should not result in a failure of the area to achieve Standard 4 for special status species.

Under the no action alternative, it is likely the pad and road would be built to access private minerals. However, as is the case with the proposed action, failure of the area to achieve Standard 4 for special status plant and animal species is not expected.

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) strictly 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.

- Emergency responses 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 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 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 could result in a release of any of these materials, which in turn could result in contamination of surface water or soil. Improper casing and cementing procedures could result in the contamination of groundwater resources. In the case of any release, emergency or otherwise, the responsible party would be liable for cleanup and any damages. Depending on the scope of the accident, any of the above referenced contingency plans would be activated to provide emergency response. At a minimum, the BLM Grand Junction Field Office contingency plan would apply.

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

No Action Alternative

Under the no action alternative, it is likely the pad would be upgraded to access private minerals, and five fee wells would be drilled. The potential for impacts remain similar as those described under the proposed action. However, the BLM Grand Junction contingency plan would not apply.

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

Surface Water

Affected Environment

Proposed activities would be located southeast of the Town of Silt and south of the Colorado River along the divide that separates two sub-watersheds. The southern half of the site is situated within the 14,802-acre Lower Divide Creek sub-watershed. An ephemeral branch of Divide Creek is situated approximately 3,100 feet south of the pad site. The northern half of the site is situated within the 42,317-acre Colorado River above Rifle Creek sub-watershed. There is an unnamed, northwest-flowing ephemeral stream located approximately 1,800 feet north of the pad location, and another that begins approximately 1,000 feet west of the pad location. These streams are tributary to Divide Creek, which in turn is tributary to the Colorado River northwest of the project area and east of the Town of Silt.

According to the *Stream Classifications and Water Quality Standards* (CDPHE, Water Quality Control Commission [WQCC] Regulation No. 37) (CDPHE 2007), the ephemeral drainages listed above are all within segment 4a that includes all tributaries to the Colorado River from the confluence with the Roaring Fork River to a point immediately below the 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.

Environmental Consequences

Proposed Action

Potential impacts to surface water associated with the proposed action include increased erosion and sedimentation of streams due to changes in channel morphology due to road and pipeline crossings, and contamination by drilling fluids, produced water, or condensate.

Surface waters would be most susceptible to sedimentation during construction, drilling, and completion activities. Pad construction would last one to two weeks, while drilling and completion would

collectively last approximately 30 to 45 days per well, or 240 to 360 days for the entire pad. After this period, reclamation activities would substantially reduce surface exposure, decreasing the risk to surface waters over the long term.

Although surface waters would be most susceptible to sedimentation over the short term, the access road would remain in place over the life of the wells at this and the 17-4 pad (i.e., 20 to 30 years) and would channel runoff during periods of precipitation. Sedimentation and stream channel impacts associated with roads would be reduced through the implementation of Best Management Practices (BMPs) and other preventive measures. As proposed, these measures would include limiting cut slope steepness, step-cutting, crowning and gravelling road surfaces, and installing and maintaining culverts and storm drainage systems.

Other elements of the proposed action are designed to mitigate risks to surface waters associated with the release of drilling fluids, produced water, and condensate. The reserve pit used to contain drilling fluids would be lined to prevent infiltration into surrounding soils. Once completion operations are complete, excess liquids would be allowed to evaporate and backfilling of the pit would be performed in a manner that would avoid incorporating the mud into surface soils.

Tanks used to store produced water and condensate would be placed in secondary containment to prevent offsite release. In the event of an accidental release, produced water and condensate would be confined for cleanup in a containment area and would not migrate to surrounding soils or surface waters. Pipelines associated with the transport of these liquids would be pressure tested to detect leakage prior to use.

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

No Action Alternative

The no action alternative would have comparable impact on surface waters as the proposed action. The construction phase would have an equal impact on surface waters as the proposed action, since the pad would still be re-constructed. During the production phase, potential impacts on surface waters would be reduced slightly since half of the wells in the proposed action would not be drilled.

Waters of the U.S.

Affected Environment

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

Environmental Consequences

Proposed Action

The proposed activities would not involve any waters of the U.S. directly. There is slight potential for sediment delivery to the Colorado River from proposed fill slopes and the access road, but no Corps permits would be required for the proposed activities.

No Action Alternative

The no action alternative would also have no direct impact to waters of the U.S. and would not require Corps permits.

Groundwater

Affected Environment

The proposed activities are located within the Division of Water Resources (DWR) Water Division 5, the 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 Tertiary Green River Formation. The Mahogany Zone is a poorly permeable oil shale, which effectively serves as an aquitard. 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 proposed pad is the Wasatch Formation (including Ft. Union equivalent at base) and Ohio Creek Formation.

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

According to the Colorado Division of Water Resources (DWR), there are no fresh water wells located within a ½ mile radius of the proposed activities. There are two fresh water wells located within a 1-mile radius of the proposed well sites, one in Section 20, approximately 3,800’ to the southeast, and one in adjacent Section 18, approximately 4,000’ to the northwest. Permitted in 2001, the Section 20 well lists a well depth of 160’, a water level of 85’, and a water yield of 3 gallons per minute (gpm). The only data available on the Section 18 well is a permit date of 1981. There are no other fresh water wells located within close proximity of the proposed new well sites. The wells are likely completed in the Wasatch Formation or surface alluvium. The use of the wells is primarily domestic; therefore it can be assumed that the quality of the water is fit for human consumption.

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 (bgs), 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 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, as the thick impermeable layers of rock at the top of the Williams Fork Formation would prevent water or hydrocarbons from migrating to potable water zones.

No Action Alternative

Under the no action alternative, there would be no impacts to groundwater resources.

Analysis on the Public Land Health Standard for Water Quality

The proposed action and the no action alternative would not likely prevent Standard 5 from being achieved.

Wetlands and Riparian Zones (includes an analysis of Public Land Health Standard 2)

Affected Environment

The nearest stream is located approximately 1,800 feet north of the pad site, while the nearest spring is located approximately 1,800 feet to the east. Thus, no developed floodplains, wetlands, or riparian vegetation reside within the project area.

Environmental Consequences

Proposed Action

The proposed action would not affect floodplains, wetlands, or riparian vegetation.

No Action Alternative

The no action alternative would not impact floodplains, wetlands, or riparian zones.

Analysis on the Public Land Health Standard for Riparian Systems

The proposed action and the no action alternative would not likely prevent Standard 2 from being achieved.

Other Affected Resources

In addition to the critical elements, the resources presented in Table 4 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 4. Other Resources Considered in the Analysis

Resource	*NA or Not Present*	*Present and Not Affected*	*Present and Affected*
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
Realty Authorizations	X		
Recreation	X		
Socio-Economics			X
Soils			X
Vegetation			X
Visual Resources			X
Wildlife, Aquatic			X
Wildlife, Terrestrial			X

Access and Transportation

Affected Environment

The project area would be located 4 air-miles southeast of Silt, Colorado. Access from the town of Silt is south along 9th Street turning east onto the River Frontage Road, turning south onto Garfield County Road 311 (CR311), turning east onto Garfield County Road 335 (CR335), turning south onto the Jolley Mesa Road, and proceeding 0.8 miles to a 'Y' intersection proceed left in a general easterly direction for 1.6 miles to an intersection with a dirt/gravel road on the left, proceed left in a general easterly direction for 0.1 miles to the existing Jolley 1C-17 well pad. Since access to the location is through private lands, public motorized travel is not available to the project area.

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 5). 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 seven days.

Table 5. Traffic Associated with Drilling and Completion Activities		
Vehicle Class	***Number of trips per well***	***Percentage of total***
16-wheel tractor trailers	88	7.6%
10-wheel trucks	216	18.6%
6-wheel trucks	452	39.0%
Pickup trucks	404	34.8%
Total	1,160	100.0%
Source: BLM 2006. Note: Trips by different vehicle types are not necessarily distributed evenly during the drilling process. Drilling and completion period is approximately 30 days per well.		

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

No Action Alternative

While an increase in traffic volume would occur under this alternative, it would be somewhat smaller than under the proposed action. The construction phase would involve a traffic level equal to that in the proposed action; the development of the five fee wells would require approximately 5,800 trips over a 150-day period, representing approximately half the increase over current levels as in the proposed action.

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. 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.

The proposed drilling project would target sandstone layers within the Williams Fork (including the Price and Cameo Coals and un-named sandstones) between 4,500 and 8,000 feet TVD. 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 Gas

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.

No Action Alternative

Under the no action alternative, the proposed action would not be approved. There would be no new impacts on the geology and mineral resources as a consequence of selecting this alternative.

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 ongoing drilling and completion activities. The nearest residence is approximately 3,000 feet southeast of the proposed drilling activities and existing access road.

Environmental Consequences

Proposed Action

There would be increased levels of noise during the construction, drilling, and completion phases of the proposed action. The noise would be most noticeable along the roads used to haul equipment and at the pad location. Drilling activities are subject to noise abatement procedures as defined in the Colorado Oil and Gas Conservation Commission Rules and Regulations (Aesthetic & Noise Control Regulations), generally a limit of 80 decibels 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 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 6), 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).

Table 6. Noise Levels Associated with Typical Construction Equipment

Equipment	***Noise Level (dB(A)***		
	50 feet	***500 feet***	***1,000 feet***
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 to nearest whole dB(A)	**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.

Traffic noise levels would also be elevated as a consequence of the proposed action. The greatest increase would be along access roads during the drilling and completion phases. Based on the La Plata County data presented in Table 7, approximately 68 dB(A) of noise (at 500 feet) would be created by each fuel and water truck that travels these roads. Less noise would be created by smaller trucks and passenger vehicles such as pickup trucks and sport utility vehicles. Although the duration of increased noise from this source would be short, it would occur repeatedly during the drilling and completion phases.

Noise impacts would decrease during the production phase. These levels would be less than during the construction phase, but greater than background noise levels. During maintenance and workovers, noise levels would increase above those associated with routine well production. Traffic noise level would impact residences located along county roads that would provide primary access into the area. While exposure to these noise levels is not likely to be harmful, it is likely to be annoying to residents. Since this pad location has been drilled once already (in 2000), nearby residences have already experienced noise levels equivalent to those that would be produced by the proposed action.

Table 7. Noise Levels Associated with Oil and Gas Production and Development				
Equipment Type	***Noise Level at 50 feet (dBA)***	***Noise Level at 500 feet (dBA)***	***Noise Level at 1000 feet (dBA)***	***Noise Level at 2000 feet (dBA)***
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)				

No Action Alternative

The impact of the no action alternative would be similar to the proposed action, although the duration of higher noise levels would be shorter because fewer wells would be developed.

Paleontology

Affected Environment

The surface formation is the Wasatch Formation, currently classified as a Class 5 unit under the Potential Fossil Yield Classification (PFYC) system. This unit is defined as a highly fossiliferous geologic unit that predictably produces significant invertebrate or plant fossils. 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, crocodilians, gars and other fishes, freshwater clams, gastropods (snails), and other invertebrates (BLM, 1999a) .

Environmental Consequences

Proposed Action

Construction activities have the potential to adversely affect scientifically important fossils that may be present in the Wasatch Formation. The greatest potential for impacts is associated with excavation of shallow bedrock that may be unearthed during construction activities. The existing well pad was constructed for initial well Jolley #1C-17 owned by Orion Energy Partners LP. Spud in March of 1982, this well was plugged and abandoned in April 1996. The surrounding surface area is historical use agriculture. A new gathering pipeline will be constructed and collocated with the existing access road. The existing Jolly #1C-17 well pad is large enough to accommodate the proposed wells and no additional well pad expansion is anticipated. It is unlikely that additional disturbance would uncover fossil resources since the native sediments have been displaced through agriculture planting cycles. Well preserved plant and animal remains are more likely to be found within intact native sediments.

An examination of the BLM paleontology database indicates that there are no known fossil localities identified within a 2-mile radius of the proposed well sites. Paleontological resources should not be impacted. In the event that paleontological resources are encountered, a standard paleontological condition of approval would be attached to the APDs (Appendix A).

No Action Alternative

Under this alternative, no impacts to paleontological resources would occur.

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 $984,417,880 or about 55 percent of total assessed value in the county. Total tax revenues from property taxes and special district levies were $86,678,430. Based on this assessed value, the top five taxpayers in the county in 2005 were mining companies.

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 $125,683,586. Half of those royalties of $62,841,784 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 $1,332,000.

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: 1) reducing scenic quality (see **Visual Resources**), 2) increased dust levels especially during construction (see **Air Quality**), and 3) increasing traffic (see **Access and Transportation**).

No Action Alternative

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

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

Affected Environment

According to the *Soil Survey of Rifle Area, Colorado* (USDA 1985), the proposed activities would be located on three soil complexes. The northern portion of the pad would be situated on Torriorthents-Camborthids-Rock outcrop complex, steep slopes. This complex is found on foothills and mountainsides with slopes from 15 to 70 percent. Parent material for this soil complex consists of sandstone and shale, with basalt boulders incorporated. This clay to loam is shallow to deep. Erosion hazard is classified as moderate to severe; the well pad would be situated on a location with severe erosion hazard. Uses for this soil complex include limited grazing, wildlife habitat and recreation.

The central and largest portion of the pad would be situated on Ildefonso stony loam, 6 to 25 percent slopes. This soil is found on mesas, benches, and sides of valleys at elevations from 5,000 to 6,500 feet. Parent material is primarily basalt. This stony loam is deep, with medium surface runoff, and erosion hazard is moderate. Uses for this soil are primarily grazing and wildlife habitat.

The southern and smallest portion of the pad, plus the pipeline tie-in, would be situated on Vale silt loam, 3 to 6 percent slopes. This soil is found on mesas, terraces, and alluvial fans at elevations from 5,000 to 7,200 feet. Parent material is calcareous dune sands. This silt loam to silty clay loam is deep and well-drained, with medium surface runoff and moderate erosion hazard. This soil is used mainly for irrigated crops and hay.

An intermittent stock pond is situated approximately 150 feet south and slightly downslope of the pad site, across the access road to the 17-4 pad.

Environmental Consequences

Proposed Action

This pad site is located on the northern edge of a low mesa, along a gentle ridge that contains thin vegetation buffers to the north and south that could help reduce the potential for sediment transport to the nearest stream, which is about 1800 feet to the north. There would be a slight amount of soil loss, loss of soil productivity, and an increase in sediment available for transport resulting from construction activities. Most of these activities would occur in an area that has relatively flat topography and would occur at some distance from nearby drainages. The access road to the 17-15 pad will adequately divert any runoff away from the stock pond situated south of the proposed activities.

No Action Alternative

The no action alternative would have comparable impact on soils as the proposed action. The construction phase would have an equal impact on soil as the proposed action, since the pad would still be re-constructed to the size estimated for the proposed action. During the production phase, impacts on soils would be reduced slightly since half of the wells in the proposed action would not be drilled.

Analysis on the Public Land Health Standard for Upland Soils

The proposed action and the no action alternative would not likely prevent Standard 1 from being achieved.

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

Affected Environment

The existing pad lies adjacent to juniper woodland interspersed with Wyoming big sagebrush. The understory consists of cheatgrass with very few native grasses and forbs.

Environmental Consequences

Proposed Action

Total short-term surface disturbance for expansion of the existing pad would be 2.96 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 0.9 acres of private land.

No Action Alternative

Under the no action alternative, it is likely the pad and road would be upgraded to access private minerals. Therefore, the no action alternative would result in the same amount of vegetation disturbance as the proposed action.

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

At this time, the landscape addressed in this EA has not had a formal Land Health Assessment completed. As such, no formal determination on conformance with Standard 3 for healthy, productive plant communities will be made until a formal Land Health Assessment and Determination Document is completed. The surface disturbance associated with the proposed action has the potential to encourage expansion and dominance of the site by non-native invasive weeds. Appendix A includes provisions to revegetate the disturbances with native vegetation and to control noxious weeds.

The proposed action would likely contribute, albeit in a minor way, to the further deterioration of vegetative communities and would move the area further from achieving conformance with the standard. The no action alternative would have the same effects as the proposed action because the well pad and road would likely be upgraded to access private minerals.

Visual Resources

Affected Environment

The proposed well pad is located in an area that received a *Visual Resource Management (VRM) Class IV* designation in the1984 Glenwood Springs Resource Management Plan. The objective for this class is to provide for management activities that require major modifications of the existing character of the landscape. The level of change to the characteristic landscape may be high. These management activities may dominate the view and be the major focus of view attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

Despite this designation, 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 only protected by landowner discretion.

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 Final Supplemental Environmental Impact Statement (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.

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 expansion of existing pads, 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 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 (includes an analysis of Public Land Health Standard 3)

Affected Environment

The well pad is located in proximity to small ephemeral drainages which eventually flow to the Colorado River approximately 1.7 miles to the north. In addition to a variety of fish species, the Colorado River contains a variety of aquatic invertebrates.

Proposed Action

Environmental Consequences

Proposed Action

The project activities would increase the potential for soil erosion and sedimentation into the ephemeral drainage and the Colorado River. However, these activities would occur in an area that has relatively flat topography and adequate vegetation buffers that would minimize the potential for sediment transport. It is unlikely, therefore, that the proposed action would cause a sediment load increase in the Colorado River that would be detectable above current background levels and aquatic species are unlikely to be impacted. Mitigation measures presented in Appendix A would be implemented to minimize potential impacts from erosion and sedimentation.

No Action Alternative

Environmental Consequences Under the no action alternative it is likely that fee minerals would be developed. Therefore, impacts similar to the proposed action would be expected.

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

Although the proposed action has the potential to increase sediment, the anticipated increase would not increase sediment loads above normal levels. Therefore, the proposed action should have minimal impact on aquatic wildlife and is not expected to affect Standard 3 land health indicators.

The no action alternative would be similar to the proposed action and would not be expected to negatively affect Standard 3.

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

Affected Environment

The project area provides habitats for various species of big game, small game, and non-game mammals and birds that are found in low- to mid-elevation habitats of west-central Colorado. The area is mapped as overall range for mule deer (*Odocoileus hemionus*), Rocky Mountain elk (*Cervus elaphus nelsoni*), black bear (*Ursus americanus*), and mountain lion (*Felis concolor*).

The Federal lease COC51146 contains a big game winter timing limitation stipulation that prohibits construction, drilling, and completion activities from January 16 through April 29.

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 be the result of 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 much-needed energy reserves that may lead to decreased over-winter survival.

Additional, indirect habitat loss may occur if increased human activity (e.g., traffic, noise) associated with infrastructure cause mule deer and elk to be displaced or alter their habitat use patterns. Indirect habitat loss generally includes habitat within an eighth of a mile of a road or well pad (e.g., BLM 1999b). Although federal lease COC51146 contains a stipulation for protecting wintering wildlife this stipulation would not be enforced due to the location on private surface and the development of private minerals concurrent with federal mineral development. Therefore, impacts described above could be expected for deer and elk during the critical wintering season.

No Action Alternative

Under the no action alternative it is likely that fee minerals would be developed. Therefore, impacts similar to the proposed action would be expected.

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

At this time, the landscape addressed in this EA has not had a formal Land Health Assessment completed. As such, no formal determination on conformance with Standard 3 for healthy, productive plant and animal communities will be made until a formal Land Health Assessment and Determination Document is completed. However, surface disturbing activities increase the potential to affect habitat through the establishment of noxious weeds. The no action alternative would be similar to the proposed action and would not be expected to measurably affect Standard 3.

SUMMARY OF CUMULATIVE IMPACTS

The *Glenwood Springs Oil and Gas Leasing and Development Final Supplemental EIS* (FSEIS) (BLM 1999) analyzed three alternatives for oil and gas development in the Glenwood Springs Resource Area (GSRA). The assessment included an analysis of impacts of past, present, and 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).

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

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

PERSONS AND AGENCIES CONSULTED

Orion Energy Partners

INTERDISCIPLINARY REVIEW

Name	***Title***	***Responsibility***
Rick Haskins	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
Jeff Cook	Wildlife Biologist	Special Status Species (Wildlife and Fish), Birds of Conservation Concern, Terrestrial Wildlife
Karen Conrath	Geologist	Groundwater, Paleontology, Geology and Minerals
John Brogan	Archaeologist	Cultural Resources and Native American Concerns

Noel Ludwig	Hydrologist	Soil, Air, Surface Water, US Waters, Noise, Prime Farmland, Wetlands
Dane Geyer	Petroleum Engineer	Downhole COAs,

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FONSI
CO140-2008-142 EA

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

DECISION RECORD

DECISION: It is my decision to approve the Applications for Permit to Drill (APDs) for the 4 wells directionally drilled from the existing Jolley 1C-17 well 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:
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 Conditions of Approval.

MITIGATION MEASURES: Mitigation measures presented in Appendix A will be incorporated as Conditions of Approval for both surface and drilling operations.

NAME OF PREPARER: Rick Haskins, Natural Resource Specialist

SIGNATURE OF AUTHORIZED OFFICIAL:

Authorized Officer

10-9-08
Date

APPENDIX A

SURFACE USE CONDITIONS OF APPROVAL

SURFACE USE CONDITIONS OF APPROVAL

The following standard surface use COAs are in addition to all stipulations attached to the respective Federal leases and to any site-specific COAs for individual well pads. Wording and numbering of these COAs may differ from those included in the EA. In cases of discrepancies, the following COAs supersede earlier versions.

1. Administrative Notification. The operator shall notify the BLM representative at least 48 hours prior to initiation of construction on access roads, well pads, or pipelines.

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 or directed by the BLM authorized officer. The level and type of treatment (watering or application of various dust agents, surfactants, and road surfacing material) may be changed in intensity and must be approved by the BLM authorized officer.

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 within flowing streams shall consist of either a piped stream diversion or the use of 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. Contact Noel Ludwig, Glenwood Springs Energy Office Hydrologist, at 970-947-5215 or Noel_Ludwig@blm.gov. 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 recommends designing drainage crossings for the 100-year event. Contact Sue Nall at 970-243-1199 x16 or susan.nall@usace.army.mil.

   Pipelines installed beneath stream crossings shall be buried 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 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 Sue Nall, Regulatory Specialist, Colorado/Gunnison Basin Regulatory Office, U.S. Army Corps of Engineers, at 970-243-1199 x16 or susan.nall@usace.army.mil.

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. Contact Noel Ludwig, Glenwood Springs Energy Office Hydrologist, at 970-947-5215 or Noel_Ludwig@blm.gov.

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 pad 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 supplied to the BLM Glenwood Springs Energy Office Ecologist (Beth Brenneman, 970-947-5232 or beth_brenneman@blm.gov) 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 reseedings 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 may 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 straw 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 reclaimed areas and shall submit an annual monitoring report 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 by **December 31**. Contact Beth Brenneman, Glenwood Springs Energy Office Ecologist, at 970-947-5232 or beth_brenneman@blm.gov.

9. Big Game Winter Range Timing Limitation. Although Federal lease COC51146 contains a stipulation for protecting wintering wildlife, this stipulation does not apply due to the surface location being on private lands underlain with private minerals that are being development concurrent with Federal mineral development. To reduce impacts to wintering big game, remote sensing should be used for production monitoring, and unavoidable monitoring or maintenance activities should be conducted between 9 a.m. and 3 p.m., to the extent practicable. These additional recommendations apply to the period from December 1 to April 30. Contact Jeff Cook, Glenwood Springs Energy Office Wildlife Biologist, at 970-947-5231 or jeffrey_cook@blm.gov.

10. Raptor Nesting. Raptor nest surveys conducted in 2008 for the Jolley 1C-17 well pad did not result in location of raptor nest structures within 0.25 mile of the well pad or 0.125 mile the pipeline. Therefore, a Raptor Nesting Timing Limitation COA is not attached to this APD. Although BLM considers surveys conducted for a NEPA Environmental Assessment to be valid for 5 years, new nests may be built and occupied between the initial surveys and project implementation. To ensure compliance with the Migratory Bird Treaty Act, the operator should schedule construction or drilling activities to begin outside the raptor nesting season (February 1 to August 15) if practicable. If initiation of construction or drilling during these dates cannot be avoided, the operator is responsible for complying with the Migratory Bird Treaty Act, which prohibits the "take" of birds or active nests (those containing eggs or young), including nest failure caused by noise and human activity. Contact Jeff Cook, Glenwood Springs Energy Office Wildlife Biologist, at 970-947-5231 or jeffrey_cook@blm.gov).

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. Several established methods to prevent bird access are known to be effective, such as netting or bird-balls. However, the use of flagging has proven ineffective in deterring birds from using ponds or pits and provides no assurance of compliance with the MBTA. 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 U.S. Fish and Wildlife Service. For further assistance, contact Creed Clayton, USFWS Biologist assigned to

the Glenwood Springs Energy Office, at 970-947-5219 or creed_clayton@fws.gov, and visit http://www.fws.gov/mountain-prairie/contaminants/oilpits.htm.

12. 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.

13. *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.

14. 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.

15. 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).

16. Visual Resources. Production facilities shall be placed to avoid or minimize visibility from travel corridors, residential areas, and other sensitive observation points—unless directed otherwise by the authorized officer due to other resource concerns—and shall be placed to maximize reshaping of cut-and-fill slopes and interim reclamation of the pad.

    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 Shale Green (Munsell 5Y4/2) to blend with the existing landscape.

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

APPENDIX B

DOWNHOLE CONDITIONS OF APPROVAL

DOWNHOLE CONDITIONS OF APPROVAL
Applications for Permit to Drill

Company/Operator: Orion Energy Partners LP

Surface Location: SESW, Section 17, Township 6 South, Range 91 West, 6th P.M.

Well Name	Well No.	Bottomhole Location	Lease
Kokopelli	17-116D	SWSW Sec. 17, T. 6S, R. 91W.	COC-51146
Kokopelli	17-115D	SWSW Sec. 17, T. 6S, R. 91W.	COC-51146
Kokopelli	17-114D	SWSW Sec. 17, T. 6S, R. 91W.	COC-51146
Kokopelli	17-113D	SWSW Sec. 17, T. 6S, R. 91W.	COC-51146

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 970-947-5212, 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. Please 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. 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.
6. 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.
7. 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' 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.
8. As a minimum, cement shall be brought to 200' above the Mesaverde. Prior to commencing fracturing operations, a CBL shall be run (from TD to 200' 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.

9. 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. Please contact Dane Geyer for clarification.
10. In accordance with 43 CFR 3162.4(b), the operator shall submit a complete set of electrical/mechanical logs in .LAS format with standard Form 3160-4, Well Completion or Recompletion Report and LOG. Please contact Karen Conrath at 970-947-5235 or karen_conrath@blm.gov for clarification.