

2004 EAU.S. Department of the Interior  
Bureau of Land Management  
Colorado River Valley Field Office  
2300 River Frontage Road  
Silt, Colorado 81652

## ENVIRONMENTAL ASSESSMENT

### NUMBER

DOI-BLM-CO-N040-2012-0022-EA

### CASEFILE NUMBER

Surface holes of all wells and bottomholes for Federal wells are located within Federal lease COC69616, Middleton Creek Unit COC068997X.

### PROJECT NAME

Proposal to Drill Six Federal Oil and Gas Wells and Ten Fee Oil and Gas Wells from Existing N22W Pad Located on Public Land in the Gant Gulch Area, Garfield County, Colorado

### PAD LOCATION

Township 7 South (T7S), Range 93 West (R93W), Section 22, SE $\frac{1}{4}$ SW $\frac{1}{4}$ , Sixth Principal Meridian.

### APPLICANT

Encana Oil & Gas (USA) Inc. Contact: Miracle Pfister, 370 Seventeenth Street, Suite 1700, Denver, Colorado 80202.

### INTRODUCTION

This Environmental Assessment (EA) has been prepared in conformance with the National Environmental Policy Act (NEPA) using the tiering process outlined in 40 CFR 1502.20. This provision encourages Federal agencies to tier new environmental documents to previously completed documents, when appropriate, for the purposes of eliminating repetitive discussions and focusing on critical project-specific natural and human environment elements present in the project vicinity and potentially affected by the project.

The current EA (DOI-BLM-CO-N040-2012-0022) is tiered to, and incorporates by reference, EA #CO140-2004-102, *Application for Permit to Drill Two Directional Wells from Proposed BLM Well Pad in southern Hunter Mesa Unit (Benefiting Program, Fluid Minerals 1310)* (BLM 2004), approved on August 22, 2004. The 2004 EA analyzed and approved a proposed well pad at which two oil and gas wells (one Federal and one Fee) have since been drilled and completed. The well pad is located on public land accessed across private lands. An access agreement with the landowners was established for the project, and Right-of-Way Grant COC68261 was issued by the BLM on November 4, 2004. Approximately 300 feet of new road and gas-gathering pipeline were constructed to intersect with a pipeline serving another well pad located to the south on private land. Encana continues to be responsible for maintenance of this road and any upgrades needed to add new wells to the existing N22W pad.

The CRVFO considered applying a Categorical Exclusion available under Section 390 of the Energy Policy Act of 2005, because (2) new disturbance of previously undisturbed areas would be only 1.6 acres, (b) less than 150 acres of surface disturbance exists on Federal lease COC69616, and (c) site-specific analysis in a previous NEPA document was completed (BLM 2004). These considerations meet the requirements of CX (390) Category 1: *Individual surface disturbances of less than five (5) acres so long as the total surface disturbance on the lease is not greater than 150 acres and site-specific analysis in a document prepared pursuant to NEPA has been previously completed.* However, the CRVFO instead concluded that preparation of a new EA tiered to the 2004 EA was appropriate for the current Proposed Action for two reasons:

- (1) The 2004 EA relied on the air quality analysis of the *GSFO Oil and Gas Leasing and Development Final Supplemental Environmental Impact Statement (FSEIS)* dated January 1999 (BLM 1999a). Results of a recently completed air quality model (BLM 2011) are now available, and it was appropriate for the CRVFO to consider that new information when analyzing air quality impacts of the Proposed Action.
- (2) Although the new surface disturbance associated with the Proposed Action would be minor, potential impacts from drilling, completing, and producing 16 additional wells could exceed those disclosed and analyzed in the 2004 EA, which analyzed the impacts of the pad and two wells.

Evaluation of the current Proposed Action by CRVFO resource specialists included site visits, review of updated geographic information system (GIS) data, and review of recent resource surveys conducted by Encana's contractors. Based on that evaluation, the BLM has determined that the current Proposed Action would have potential adverse impacts substantially different from those disclosed and analyzed in the 2004 EA for 11 of the 19 environmental elements reviewed. Potential impacts to these 11 environmental elements are addressed below in the current EA. The list below shows the 19 elements considered for inclusion in this EA. Those in boldface type have been re-analyzed in conjunction with the current Proposed Action. The 2004 EA continues to be adequate relative to the other elements listed.

**Access and Transportation**

**Air Quality**

Cultural Resources

Fossil Resources

**Invasive Non-Native Plants**

**Migratory Birds**

Native American Religious Concerns

**Noise**

Realty Authorizations

Socioeconomics

**Soils**

**Special Status Species**

**Vegetation**

**Visual Resources**

Wastes, Hazardous and Solid

**Water Quality, Surface** and Ground

**Wildlife, Terrestrial** and Aquatic

## **PROPOSED ACTION**

Encana Oil and Gas (USA) Inc. (Encana) proposes to drill and develop 16 new oil and gas wells from the existing N22W well pad (six Federal wells and ten Fee wells, see Table 1) located on public land in the Gant Gulch Area approximately 7.5 air miles south of Rifle, Colorado (Figure 1). Accommodating these additional wells would require expansion of the pad by 1.6 acres from its current reclaimed condition of 4 acres to a new total disturbance of approximately 5.6 acres (Figure 2). Total surface disturbance would be reduced to 1.6 acres following interim reclamation (Figure 3). Encana plans to start drilling these wells in the winter of 2012.

Federal lease COC69616 has a 5-month timing limitation (TL) from December 1 to April 30 annually to protect wildlife use of big game winter range. This TL would prohibit traffic associated with construction, drilling, and completion activity from traveling the portion of the access road on BLM land. An exception to the TL may be granted by the BLM if, in collaboration with Colorado Parks and Wildlife (CPW), it is determined that granting the exception would not result in significant adverse impacts to wintering big game. Such a determination may be based, for example, on proposed mitigation measures.

<b>Table 1. Surface and Bottomhole Locations of Proposed Federal Wells</b>			
<i>Proposed Wells</i>	<i>Federal Lease</i>	<i>Surface Location</i>	<i>Bottomhole Location</i>
Encana MCU 22-13A (N22W)	COC69616	567 feet FSL, 2073 feet FWL SE $\frac{1}{4}$ SW $\frac{1}{4}$ , Section 22, T7S R93W	1282 feet FSL, 722 feet FWL SW $\frac{1}{4}$ SW $\frac{1}{4}$ , Section 22, T7S R93W
Encana MCU 22-13B (N22W)	COC69616	575 feet FSL, 2049 feet FWL SE $\frac{1}{4}$ SW $\frac{1}{4}$ , Section 22, T7S R93W	942 feet FSL, 697 feet FWL SW $\frac{1}{4}$ SW $\frac{1}{4}$ , Section 22, T7S R93W
Encana MCU 22-13C (N22W)	COC69616	567 feet FSL, 2057 feet FWL SE $\frac{1}{4}$ SW $\frac{1}{4}$ , Section 22, T7S R93W	600 feet FSL, 720 feet FWL SW $\frac{1}{4}$ SW $\frac{1}{4}$ , Section 22, T7S R93W
Encana MCU 22-14A (N22W)	COC69616	567 feet FSL, 2123 feet FWL SE $\frac{1}{4}$ SW $\frac{1}{4}$ , Section 22, T7S R93W	1200 feet FSL, 2400 feet FWL SE $\frac{1}{4}$ SW $\frac{1}{4}$ , Section 22, T7S R93W
Encana MCU 22-14B (N22W)	COC69616	575 feet FSL, 2131 feet FWL SE $\frac{1}{4}$ SW $\frac{1}{4}$ , Section 22, T7S R93W	860 feet FSL, 2420 feet FWL SE $\frac{1}{4}$ SW $\frac{1}{4}$ , Section 22, T7S R93W
Encana MCU 22-14C (N22W)	COC69616	567 feet FSL, 2106 feet FWL SE $\frac{1}{4}$ SW $\frac{1}{4}$ , Section 22, T7S R93W	520 feet FSL, 2405 feet FWL SE $\frac{1}{4}$ SW $\frac{1}{4}$ , Section 22, T7S R93W

The existing access road and pipeline would continue to serve the planned wells for the N22W pad in their present condition. The source of fresh water to be used for drilling would be water from Encana's available water rights from the river and would be hauled to the pad location. For completions, Encana would lay up to an 8-inch temporary surface waterline from either the Benzel Water Treatment Facility or the Hunter Mesa Water Treatment Facility. The route, to be determined, would cross Fee surface until it reaches the road turnoff to the N22W pad. The surface line would follow the existing access road on BLM surface for approximately 100 feet. The temporary surface line would be removed upon completion of the wells. All water used in connection with these operations would be stored in tanks in an effort to conserve and re-use the water.

Drilling fluids would be contained. Upon termination of drilling and completion operations, the mud would be transferred to another drilling location for use, dewatered and recycled, or removed and disposed of at an approved waste disposal facility. Produced fluids from production operations would be confined to flow back tanks and would be recycled and used for drilling, completion or fracing for another well or location. Drill cuttings would be deposited in a steel cuttings bin (45 feet x 10 feet x 12 feet) and cuttings pile. Cuttings deposited in the steel pit would be solidified with sawdust. The cuttings would be moved from the steel pit to the cutting pile. Once drilling is finished the cuttings would be buried on location and reclaimed.

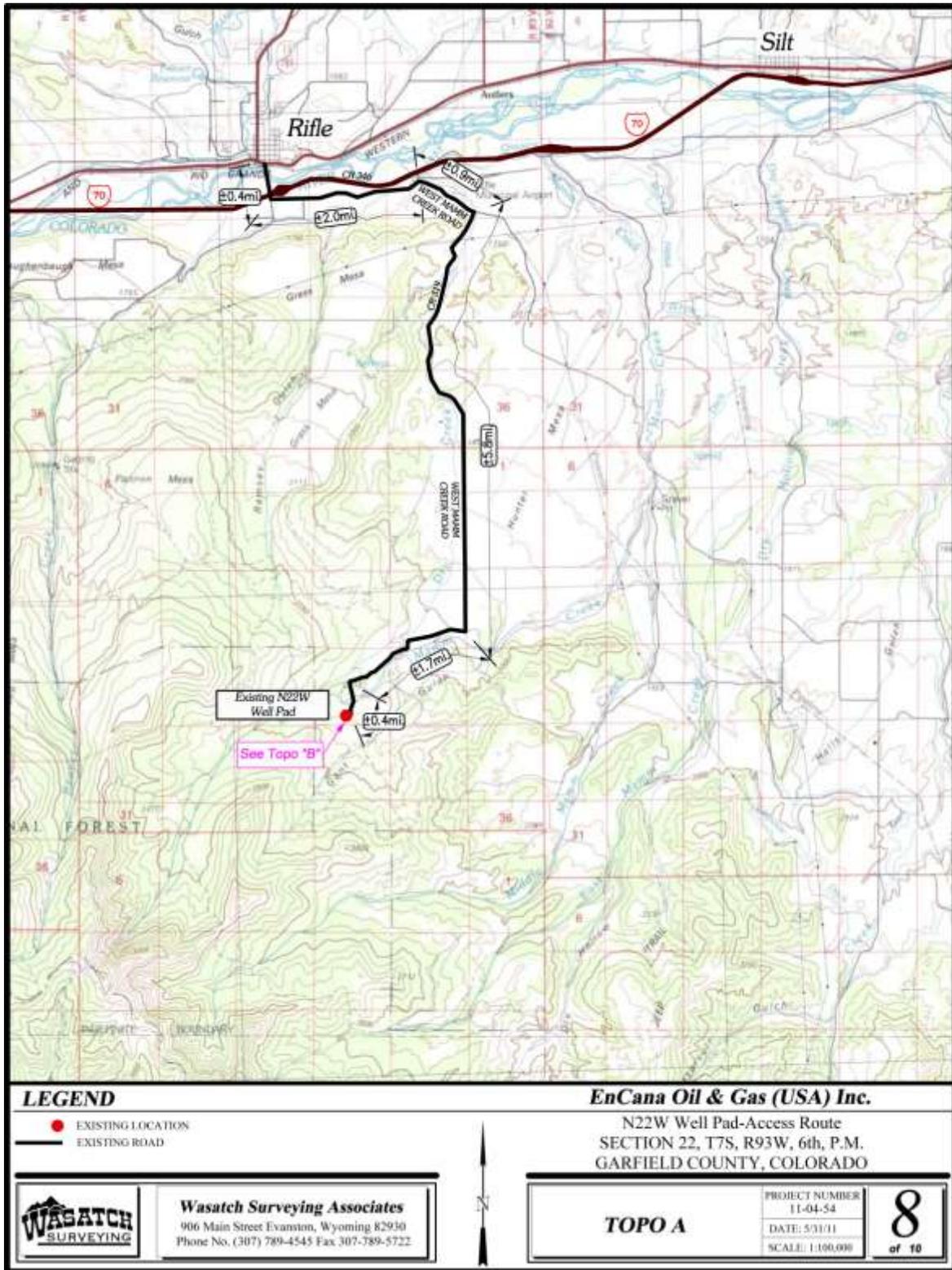


Figure 1. Project Location Map

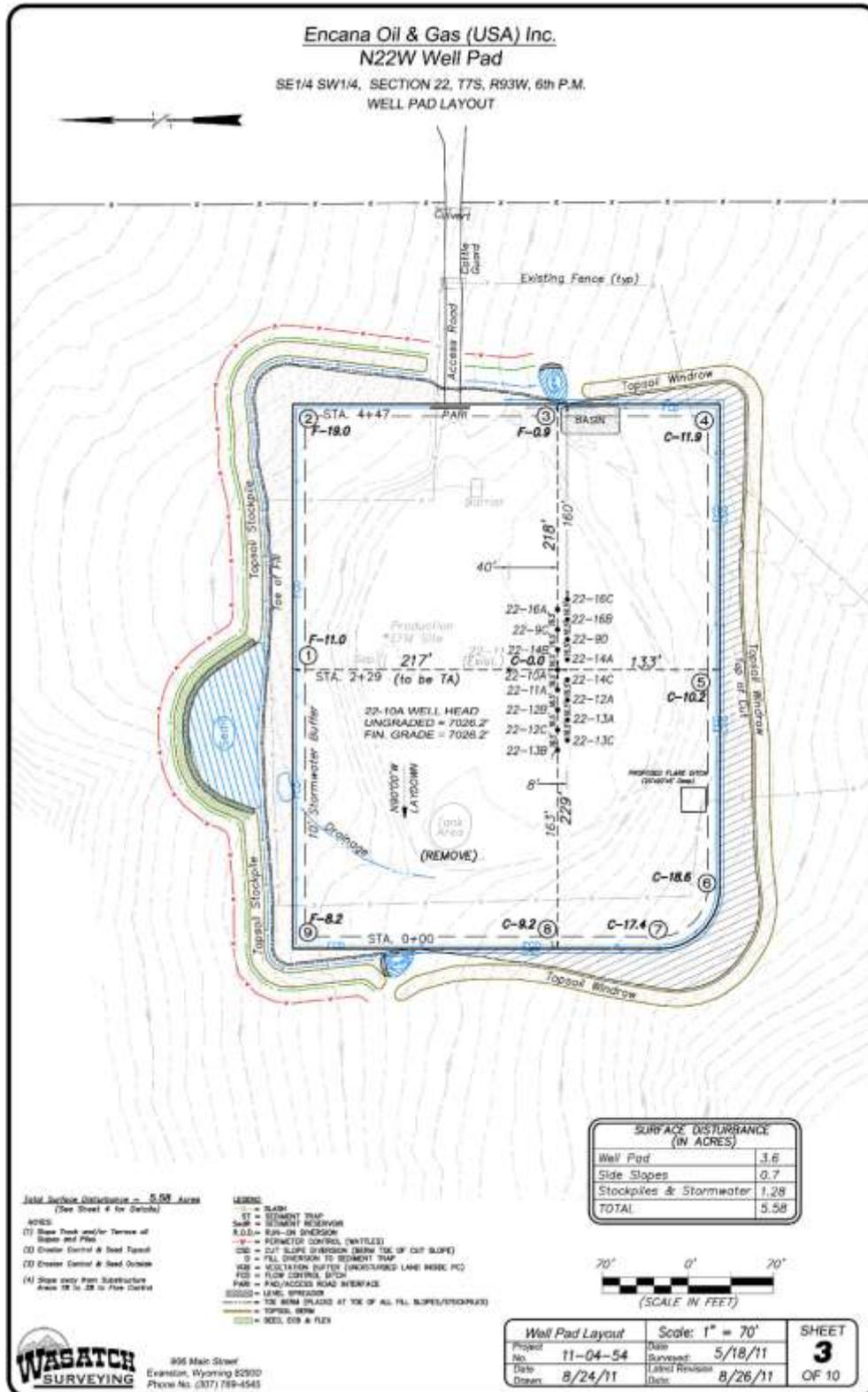


Figure 2. Well Pad Layout



## **NO ACTION ALTERNATIVE**

The Proposed Action involves drilling ten Fee wells in addition to six Federal wells from BLM surface. Although the BLM cannot deny the right to drill and develop the Federal oil and gas lease, individual APDs can be denied to prevent unnecessary and undue degradation. In addition, the BLM can deny Encana the ability to use BLM surface lands to access the non-Federal (Fee) mineral estate.

The No Action Alternative constitutes denial of the Federal APD(s) and denial of use of the BLM surface to access Fee minerals. Consequently, none of the planned development activities outlined in the Proposed Action would occur. However, in the event that the No Action Alternative were selected by the BLM as an outcome of the EA process, Encana would be expected to drill from a different location to avoid the BLM surface described in the Proposed Action.

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

The purpose of the Proposed Action is to develop oil and gas resources on Federal lease COC69616 consistent with existing Federal lease rights. The action is needed to increase the development of oil and gas resources for commercial marketing to the public.

## **SUMMARY OF LEASE STIPULATIONS**

The six Federal wells and ten Fee wells would be directionally drilled from the existing N22W pad located on BLM-administered public land. The bottomholes of the six Federal wells would be within Federal lease COC69616. Lease stipulations are listed on the lease (Table 2).

<i>Description of Lands</i>	<i>Stipulations</i>
T7S-R93W 6 <sup>TH</sup> SEC. 22, SWNW, S1/2SW	Timing Limitation: To Protect Big Game Winter Habitat (12/1 to 4/30).
T7S-R93W 6 <sup>TH</sup> SEC. 22, SWNW	Controlled Surface Use: To Protect Perennial Water Impoundments and Streams, and/or Riparian/Wetland Vegetation.
T7S-R93W 6 <sup>TH</sup> ALL LANDS	Controlled Surface Use: To Protect Fragile Soils.

## **PLAN CONFORMANCE REVIEW**

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

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

Decision Language: The 1991 Oil and Gas Plan Amendment (BLM 1991) included the following at page 3: “697,720 acres of BLM-administered mineral estate within the Glenwood Springs Resource Area are open to oil and gas leasing and development, subject to lease terms and (as applicable) lease stipulations” (BLM 1991, page 3). This decision was carried forward unchanged in the 1999 ROD and RMP

amendment at page 15 (BLM 1999b): “In areas being actively developed, the operator must submit a Geographic Area Proposal (GAP) [currently referred to as a Master Development Plan, MDP] that describes a minimum of 2 to 3 years of activity for operator controlled leases within a reasonable geographic area.”

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

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

During its internal scoping process for the current Proposed Action, CRVFO resource specialists identified the following elements of the natural and human environment as present in the project vicinity and potentially affected by the project. However, an evaluation of the Proposed Action in relation to current resource conditions indicates that the following elements would be subject to substantially different impacts from those disclosed, analyzed, and mitigated in EA #CO140-2004-102 (BLM 2004) to which the current EA is tiered. Those resources and uses—**Access and Transportation, Air Quality, Invasive Non-Native Plants, Migratory Birds, Noise, Soils, Special Status Species, Vegetation, Visual Resources, Surface Water Quality, and Terrestrial Wildlife**—are discussed in the subsections that follow. The 2004 EA remains adequate with regard to impact analysis to the other environmental elements considered: Cultural Resources, Fossil Resources, Native American Religious Concerns, Realty Authorizations, Socioeconomics, Hazardous and Solid Wastes, Groundwater Quality, and Aquatic Wildlife to be adequately addressed by the earlier EA, notwithstanding the proposed addition of 16 new wells.

#### **Access and Transportation**

Access to the N22W well pad is through privately owned lands with no legal public access. The Proposed Action would result in a substantial increase in truck traffic compared to the amount originally analyzed. The largest increase in truck use would be during rig-up, drilling, and completion activities. Approximately 1,160 truck trips over a 30-day period would be required to support the drilling and completion of each well. Once the wells are producing, traffic would decrease to occasional visits for monitoring or maintenance activities. Each well may have to be recompleted once per year, requiring three to five truck trips per day for approximately 7 days. Degradation of field development roads due to additional well development would be mitigated with conditions of approval (COAs) in Appendix A.

Under the No Action Alternative, no Federal or Fee wells would be added to the existing pad. Consequently, no new impacts would occur.

#### **Air Quality**

Previous air analysis for NW22 pad indicated that localized short-term increases of air impacts would occur but would be below applicable air quality standards. The proposed project includes expanding the existing NW22 pad and drilling, completing and operating 16 new wells. Since the analysis in 2004, a new air quality model completed for oil and gas development in the CRVFO area has incorporated

updated ambient air quality data as well as updated national and state air quality standards. Garfield County, within which the project area lies, continues to attain the Colorado Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS).

The 2011 Air Resources Technical Support Document (ARTSD)(BLM 2011) presenting results of the new air model indicates that the assumed level of additional oil and gas development would have no or negligible long-term adverse impacts on air quality from the project. Since the Proposed Action is within the scope of the additional development analyzed in that document, the Proposed Action is not expected to have adverse effects on air quality (BLM 2011).

Advances in drilling technology incorporated into the new model and associated with the current Proposed Action include use of directional drilling to add new wells to existing pads instead of building one or more new pads, self-contained flare units to minimize emissions to the atmosphere, closed-loop drilling to minimize emissions by recycling fluids and avoid storing them in open pits, and greater use of pipelines instead of trucks to transport fluids and reduce tailpipe emissions.

Under the No Action Alternative, no Federal or Fee wells would be added to the existing pad. Consequently, no new impacts would occur.

### **Invasive Non-Native Plants**

No noxious weeds or invasive non-native species were documented in the project area prior to the N22W well pad construction. Nonetheless, surface-disturbing activities associated with the Proposed Action would provide a niche for the invasion and establishment of invasive non-native species, including State-listed noxious weeds and other species. Consequently, the standard weed control COA would be attached to APDs to require periodic monitoring and weed control practices to ensure that these weedy pants are controlled (see Appendix A).

Under the No Action Alternative, no Federal or Fee wells would be added to the existing pad. Consequently, no new impacts would occur.

### **Migratory Birds**

Under the Proposed Action, 5.6 acres of disturbance would occur on BLM land as a result of pad construction, of which 1.6 acres would include land not previously disturbed and reclaimed. Removal of pinyon-juniper, sagebrush, and mixed shrub species would result in loss of existing and potential nesting sites for perching birds. While habitat loss and fragmentation may affect individual birds, it is not expected to adversely impact a species as a whole. If construction, drilling, or completion activities occur during the nesting season, visual and noise disturbance near active nests could cause nest abandonment and failure, reducing the productivity of affected species. Construction activity during the nesting season could also result in the destruction of clutches and/or mortality of nestlings.

The operator remains subject to the MBTA, administered by the U.S. Fish and Wildlife Service (USFWS), which precludes the “take” of any raptor or most other native species. Under the Act, the term “take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The USFWS interprets “harm” and “kill” to include loss of eggs or nestlings due to abandonment or reduced attentiveness by one or both adults as a result of disturbance by human activity, as well as physical destruction of an occupied nest. No raptor nests were identified in the project area prior to the N22W well pad initial construction, and no new nests were identified in a recent raptor survey conducted for the current Proposed Action (Wildlife Specialties 2011).

Under the No Action Alternative, no Federal or Fee wells would be added to the existing pad. Consequently, no new impacts would occur.

### **Noise**

The project would result in increased levels of noise during the construction, drilling, and completion phases. Drilling activities are subject to noise abatement procedures as defined in the 2006 COGCC Rules and Regulations (Aesthetic & Noise Control Regulations). Noise levels under the current Proposed Action would not be expected to exceed those analyzed in the 2004 EA, but the duration of noise impacts would be greater than analyzed in that EA due to the drilling and completion and period maintenance of up to 16 additional wells.

Under the No Action Alternative, no Federal or Fee wells would be added to the existing pad. Consequently, no new impacts would occur.

### **Soils**

The Proposed Action would involve surface disturbance of 1.6 acres in addition to the existing 4 acres previously disturbed. After interim reclamation under the Proposed Action, long-term surface disturbance would be reduced to 1.6 acres. In areas susceptible to erosion or possible slope instability issues, construction techniques (retaining structures, full bench cut, no side-casting, etc.), proper erosion control, and geotechnical analysis and design may be required. Construction activities would cause mixing of soil horizons, slight to moderate increases in local soil loss, loss of soil productivity, and sediment available for transport to surface waters. Weed infestation resulting from disturbance would impact soil productivity. Throughout the affected area, the potential would also exist for accidental spills or leaks of petroleum products and hazardous materials during construction, drilling activities and long term operations for the life of the wells. These events would cause soil contamination and may decrease the soil fertility and revegetation potential. After interim reclamation, the impacts to soils and sediment transport would be greatly reduced through the establishment of a self-sustaining perennial plant cover.

Under the No Action Alternative, no Federal or Fee wells would be added to the existing pad. Consequently, no new impacts would occur.

### **Special Status Species**

In 2008, the BLM prepared a Programmatic Biological Assessment (PBA) addressing water-depleting activities associated with BLM's fluid minerals program in the Colorado River Basin in Colorado. In response to this PBA, the USFWS issued a Programmatic Biological Opinion (PBO) (ES/GJ-6-CO-08-F-0006) on December 19, 2008. The PBO concurred with BLM's effects determination of "**May Affect, Likely to Adversely Affect**" relative to four species of big-river fishes Federally listed as Endangered. These species—the Colorado pikeminnow, humpback chub, bonytail chub, and razorback sucker—occur in the Colorado River downstream from the project area and are potentially adversely affected by depletions associated with oil and gas projects. To offset these impacts, the BLM has established a Recovery Agreement that includes a one-time fee per well. The estimated depletions from the Proposed Action will be added to the CRVFO tracking log and submitted to the USFWS per the PBA/PBO at the end of the year to account for depletions associated with BLM's fluid mineral program. The calculated mitigation fees are used by the USFWS for mitigation projects and contribute to the recovery of these endangered species through restoration of habitat, propagation, and genetics management, instream flow identification and protection, program management, non-native fish management, research and monitoring, and public education.

No other Federally listed, proposed, or candidate threatened or endangered species, and no BLM sensitive species, would be potentially affected by the Proposed Action in a manner or to an extent not analyzed in the 2004 EA to which this document is tiered.

Under the No Action Alternative, no Federal or Fee wells would be added to the existing pad. Consequently, no new impacts would occur.

### **Vegetation**

The pad lies within the mixed mountain brush vegetation type. Vegetation is predominantly oakbrush (*Quercus gambelii*) with some Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), antelope bitterbrush (*Purshia tridentata*), and serviceberry (*Amelanchier alnifolia*). Due to the mesic nature of the site, reclamation potential should be good.

Under the Proposed Action, 5.6 acres of surface disturbance would occur, including 1.6 acres of new disturbance and 4 acres in the existing reclaimed area of the pad. Following interim reclamation, all but 1.6 acres would be revegetated with the remaining area comprising the working area of the pad supporting the access road, wellheads, production units, and storage tanks. With implementation of standard COAs (Appendix A), a self-sustaining cover of native perennial species could be established in 2 to 3 years on areas of interim reclamation. However, because of periodic workovers and the potential for additional well bores in the future, vegetation is likely to remain in an early seral stage for the life of the wells.

Under the No Action Alternative, no Federal or Fee wells would be added to the existing pad. Consequently, no new impacts would occur.

### **Visual Resources**

The Proposed Action would occur on public land classified as Visual Resource Management (VRM) Class III in the current CRVFO land use plan. The objective of VRM Class III is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may not attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

The Proposed Action would not affect any of the key viewing areas or viewsheds, such as the I-70 corridor or the town of Rifle. An existing buffer of riparian vegetation, including large cottonwoods, and dense oakbrush, to the north of the pad location would provide screening from County Road 319 (West Mamm Creek Road) and nearby private residences. The topography of the area is relatively flat, reducing the amount of cut and fill required to meet natural grade. Total surface disturbance resulting from the project would be 5.6 acres, of which 1.6 acres would be new disturbance outside the original pad footprint. Following interim reclamation, all but 1.6 acres would be revegetated with the remaining area comprising the working area of the pad supporting the access wellheads, production units, and storage tanks. With implementation of best management practices (BMPs) related to reclamation, facility paint colors, and taking advantage of existing vegetation to provide screening would largely mitigate long-term impacts. Mitigation measures to reduce visual impacts to meet VRM Class III objectives would be applied as COAs (Appendix A).

Short-term visual impacts due to pad construction and drilling and completion activities would occur within the project area. The construction of the pad would create contrast within the landscape by

removing the existing vegetation, exposing bare ground, and creating distinct lines and forms within the landscape. The new pad and surface facilities would increase the presence of drilling rigs, heavy equipment (e.g., dozers, graders, trackhoes), and vehicular traffic with an associated increase in dust, light pollution and well flaring.

Under the No Action Alternative, no Federal or Fee wells would be added to the existing pad. Consequently, no new impacts would occur.

### **Water Quality, Surface**

The Proposed Action would occur within the Mamm Creek 6<sup>th</sup> code hydrologic unit, which drains to the Colorado River 8 miles to the north of the project. According to the *Stream Classifications and Water Quality Standards* (CDPHE, Water Quality Control Commission [WQCC] Regulation No. 37) (CDPHE 2007), unnamed ephemeral drainages that drain the project sections are within segment 4a, which includes tributaries to the Colorado River from its confluence with the Roaring Fork River to a point immediately below its confluence with Parachute Creek. Following is a brief description of segments 4a.

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

All streams within segment 4a are on the State of Colorado's 303(d) List of Impaired Waters and Monitoring and Evaluation List (CDPHE, WQCC Regulation No. 93) (CDPHE 2010) for naturally high levels of selenium; no streams within segment 4e are on this list. Colorado's Monitoring and Evaluation List identifies water bodies where there is reason to suspect water quality problems, but uncertainty also exists regarding one or more factors. No stream segments within the project area are on the State of Colorado's Monitoring and Evaluation List (CDPHE 2010).

Potential impacts to surface water associated with the Proposed Action include increased erosion and sedimentation of streams, changes in channel morphology due to road and pipeline crossings, and contamination by drilling fluids, produced water, or condensate. Surface waters would be most susceptible to sedimentation during construction, drilling, and completion activities. After this period, reclamation activities would substantially reduce surface exposure, decreasing the risk to surface waters over the long term. Best Management Practices will be employed to reduce short and long term impacts to surface waters. Other elements of the Proposed Action are designed to mitigate risks to surface waters associated with the release of drilling fluids, produced water, and condensate. A closed-loop drilling system would be implemented which recycles drilling fluids; cuttings would be dried through the use of a shaker system and be stacked cuttings trench. A traditional reserve pit would not be constructed.

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

Waters of the U.S. located in the project vicinity include ephemeral drainages and the mainstem of Mamm Creek. Section 404 of the Clean Water Act requires a Department of the Army permit from the U.S. Army Corps of Engineers (USACE) prior to discharging dredged or fill material into waters of the U.S. as defined by 33 CFR Part 328. A permit is required for both permanent and temporary discharges into waters of the United States; larger discharges require an individual permit, while smaller discharges may be granted a nationwide permit (NWP). No new crossings of waters of the U.S. are included in the Proposed Action, nor is pad construction proposed, road alignments or pipeline installation that could discharge fill into Waters of the U.S.

Under the No Action Alternative, no Federal or Fee wells would be added to the existing pad. Consequently, no new impacts would occur.

### **Wildlife, Terrestrial**

Total surface disturbance for the N22W pad reconstruction would be 5.6 acres. In areas where shrubs and trees would be disturbed, impacts to wildlife from loss of thermal and/or hiding cover would extend for 20 to 30+ years due to slow reestablishment of these species. Surface-disturbing activities within these important habitats during the winter and during migratory seasons have the potential to displace mule deer and elk.

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

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

Under the No Action Alternative, no Federal or Fee wells would be added to the existing pad. Consequently, no new impacts would occur.

### **SUMMARY OF CUMULATIVE IMPACTS**

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

None of the cumulative impacts was described in the 1999 FSEIS (BLM 1999a) or EA #CO140-2004-102 (BLM 2004) as significant. Nonetheless, while new technologies and regulatory requirements have reduced the impacts of some land uses, it is clear that past, present, and reasonably foreseeable future actions have had and would continue to have adverse effects on various elements of the human environment. Anticipated impacts for existing and future actions range from negligible to locally major, and primarily negative, for specific resources.

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

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

**PERSONS AND AGENCIES CONSULTED**

Encana Oil & Gas (USA) Inc.: Miracle Pfister

**INTERDISCIPLINARY REVIEW**

BLM staff from the CRVFO who participated in the preparation of this EA, including review of survey results submitted by the operator’s consultants, evaluation of impacts likely to occur from implementation of the Proposed Action, and identification of appropriate COAs to be attached and enforced by BLM, are listed in Table 3.

<b>Table 3. BLM Interdisciplinary Team Authors and Reviewers</b>		
<i>Name</i>	<i>Title</i>	<i>Areas of Participation</i>
D. J. Beaupeurt	Realty Specialist	Lands and Realty
John Brogan	Archaeologist	Cultural Resources, Native American Religious Concerns
Julie McGrew	Natural Resource Specialist	EA Project Lead, Access and Transportation, Invasive Non-native Species, Socioeconomics, Vegetation, and Visual Resources
Allen Crockett, Ph.D.	Supervisory Natural Resource Specialist	NEPA Review
Bob Hartman	Petroleum Engineer	Downhole COAs
Shauna Kocman, Ph.D., P.E.	Hydrologist Environmental Engineer	Air Quality, Noise, Soils, Surface Water, Waters of the U.S.
Sylvia Ringer	Wildlife Biologist	Migratory Birds, Special-status Species (Animals), Wildlife, Aquatic and Terrestrial
Todd Sieber	Geologist	Geology and Minerals, Groundwater, Paleontology

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## **APPENDIX A**

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

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## **Surface Use Conditions of Approval** **DOI-BLM-CO-N040-2012-0022-EA**

The following standard surface use COAs are in addition to all stipulations attached to the respective Federal leases and to any site-specific COAs for individual well pads. Wording and numbering of these COAs may differ from those included in the EA #CO140-2004-102. 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. If requested by the BLM representative, the operator shall schedule a pre-construction meeting, including key operator and contractor personnel, to ensure that any unresolved issues are fully addressed prior to initiation of surface-disturbing activities or placement of production facilities.
2. Road Construction and Maintenance. Roads shall be crowned, ditched, surfaced, drained with culverts and/or water dips, and constructed to BLM Gold Book standards. Initial gravel application shall be a minimum of 6 inches. The operator shall provide timely year-round road maintenance and cleanup on the access roads. A regular schedule for maintenance shall include, but not be limited to, blading, ditch and culvert cleaning, road surface replacement, and dust abatement. When rutting within the traveled way becomes greater than 6 inches, blading and/or gravelling shall be conducted as approved by the BLM.
3. Dust Abatement. The operator shall implement dust abatement measures as needed to prevent fugitive dust from vehicular traffic, equipment operations, or wind events. The BLM may direct the operator to change the level and type of treatment (watering or application of various dust agents, surfactants, and road surfacing material) if dust abatement measures are observed to be insufficient to prevent fugitive dust.
4. Drainage Crossings and Culverts. Construction activities at perennial, intermittent, and ephemeral drainage crossings (e.g. burying pipelines, installing culverts) shall be timed to avoid high flow conditions. Construction that disturbs any flowing stream shall utilize either a piped stream diversion or a cofferdam and pump to divert flow around the disturbed area.

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

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

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

impacts to waters of the U.S. may require mitigation. Contact the USACE Colorado West Regulatory Branch at 970-243-1199 ext. 17. Copies of any printed or emailed approved USACE permits or verification letters shall be forwarded to the BLM.

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

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

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

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

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

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

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

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

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

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

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

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

Where practicable, seed shall be installed by drill-seeding to a depth of 0.25 to 0.5 inch. Where drill-seeding is impracticable, seed may be installed by broadcast-seeding at twice the drill-seeding rate, followed by raking or harrowing to provide 0.25 to 0.5 inch of soil cover or by hydroseeding and hydromulching. If hydroseeding and hydromulching are used, these shall be conducted as separate steps to ensure adequate contact of seeds with the soil and adequate coverage by the mulch.

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

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

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

- h. Erosion Control. Cut-and-fill slopes shall be protected against erosion with the use of water bars, lateral furrows, or other measures approved by the BLM. Cut-and-fill slopes along drainages or in areas with high erosion potential shall also be protected from erosion using hydromulch designed specifically for erosion control or biodegradable blankets/matting, bales, or wattles of weed-free straw or weed-free native grass hay. A well-anchored fabric silt fence shall also be placed at the toe of cut-and-fill slopes along drainages or to protect other sensitive areas from deposition of soils eroded off the slopes. Additional BMPs shall be employed as necessary to reduce soil erosion and offsite transport of sediments.
- i. Site Protection. The pad shall be fenced to BLM standards to exclude livestock grazing for the first two growing seasons or until seeded species are firmly established, whichever comes later. The seeded species will be considered firmly established when at least 50 percent of the new plants are producing seed. The BLM will approve the type of fencing.
- j. Monitoring. The operator shall conduct annual monitoring surveys of all sites categorized as “operator reclamation in progress” and shall submit an annual monitoring report of these sites to the BLM by **December 31** of each year. The monitoring program shall use the four Reclamation Categories defined in Appendix I of the 1998 DSEIS to assess progress toward reclamation objectives. The annual report shall document whether attainment of reclamation objectives appears likely. If one or more objectives appear unlikely to be achieved, the report shall identify appropriate corrective actions. Upon review and approval of the report by the BLM, the operator shall be responsible for implementing the corrective actions or other measures specified by the BLM.
8. Weed Control. The operator shall regularly monitor and promptly control noxious weeds or other undesirable plant species as set forth in the Glenwood Springs Field Office *Noxious and Invasive Weed Management Plan for Oil and Gas Operators*, dated March 2007. A Pesticide Use Proposal (PUP) must be approved by the BLM prior to the use of herbicides. Annual weed monitoring reports shall be submitted to BLM by **December 1**.

9. Big Game Winter Range Timing Limitation. To minimize impacts to wintering big game, no construction, drilling or completion activities shall occur during a Timing Limitation (TL) period from **December 1 to April 30 annually**.
10. Bald and Golden Eagles. It shall be the responsibility of the operator to comply with the Bald and Golden Eagle Protection Act (Eagle Act) with respect to “take” of either eagle species. Under the Eagle Act, “take” includes to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest and disturb. “Disturb” means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior. Avoidance of eagle nest sites, particularly during the nesting season, is the primary and preferred method to avoid a take. Any oil or gas construction, drilling, or completion activities planned within 0.5 mile of a bald or golden eagle nest, or other associated activities greater than 0.5 miles from a nest that may disturb eagles, should be coordinated with the BLM project lead and BLM wildlife biologist and the USFWS representative to the BLM Field Office (970-876-9051).
11. Raptor Nesting. To protect nesting raptors, a survey shall be conducted prior to construction, drilling, or completion activities that are to begin during the raptor nesting season (**February 1 to August 15**). The survey shall include all potential nesting habitat within 0.25 mile of a well pad or 0.125 mile of an access road, pipeline, or other surface facility. Results of the survey shall be submitted to the BLM. If a raptor nest is located within the buffer widths specified above, a 60-day raptor nesting TL will be applied by the BLM to preclude initiation of construction, drilling, and completion activities during the period of **March 15 to May 15**. The operator is responsible for complying with the MBTA, which prohibits the “take” of birds or of active nests (those containing eggs or young), including nest failure caused by human activity (see COA for Migratory Birds).
12. Migratory Birds. It shall be the responsibility of the operator to comply with the Migratory Bird Treaty Act (MBTA) with respect to “take” of migratory bird species, which includes injury and direct mortality resulting from human actions not intended to have such result. To minimize the potential for the take of a migratory bird, the operator shall take reasonable steps to prevent use by birds of fluid-containing pits associated with oil or gas operations, including but not limited to reserve pits, produced-water pits, hydraulic fracturing flowback pits, evaporation pits, and cuttings trenches. Liquids in these pits—whether placed or accumulating from precipitation—may pose a risk to birds as a result of ingestion, absorption through the skin, or interference with buoyancy and temperature regulation.

Based on low effectiveness of brightly colored flagging or spheres suspended over a pit, the operator shall install netting with a mesh size of 1 to 1.5 inches, and suspended at least 4 feet above the fluid surface, on all pits into which fluids are placed, except for storage of fresh water in a pit that contains no other material open pit. The netting shall be installed within 24 hours following fluids release. In addition, oil slicks and oil sheens shall be promptly skimmed off the fluid surface. The requirement for prompt skimming of oil slicks and oil sheens also applies to cuttings trenches in which precipitation has accumulated. To minimize the potential for violation of the MBTA, the BLM recommends installation of netting at cuttings trenches left open for more than 24 hours following cessation of drilling and completion activities during a continuous development cycle on a pad. The recommendation for prompt netting does not apply to cuttings trenches during periods of active manipulation for cuttings management, remediation of contaminated materials, or other purposes.

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

13. Birds of Conservation Concern. Pursuant to BLM Instruction Memorandum 2008-050, all surface-disturbing activities are prohibited from **May 1 to July 1** to reduce impacts to Birds of Conservation Concern (BCC). An exception to this TL will be granted if nesting surveys conducted no more than one week prior to surface-disturbing activities indicate that no BCC species are nesting within 30 meters (100 feet) of the area to be disturbed. Nesting shall be deemed to be occurring if a territorial (singing) male is present within the distance specified above. Nesting surveys shall include an aural survey for diagnostic vocalizations in conjunction with a visual survey for adults and nests. Surveys shall be conducted by a qualified breeding bird surveyor between sunrise and 10:00 AM under favorable conditions for detecting and identifying a BCC species. This provision does not apply to ongoing construction, drilling, or completion activities that are initiated prior to May 1 and continue into the 60-day period at the same location.
14. Range Management. Range improvements (fences, gates, reservoirs, pipelines, etc.) shall be avoided during development of natural gas resources to the maximum extent possible. If range improvements are damaged during exploration and development, the operator will be responsible for repairing or replacing the damaged range improvements. If a new or improved access road bisects an existing livestock fence, steel frame gate(s) or a cattle guard with associated bypass gate shall be installed across the roadway to control grazing livestock.
15. Ips Beetle. To avoid mortality of pinyon pines due to infestations of the *Ips* beetle, any pinyon trees damaged during road, pad, or pipeline construction shall be chipped after being severed from the stump or grubbed from the ground, buried in the toe of fill slopes (if feasible), or cut and removed from the site within 24 hours to a location approved by the Colorado State Forest Service.
16. Fossil Resources. All persons associated with operations under this authorization shall be informed that any objects or sites of paleontological or scientific value, such as vertebrate or scientifically important invertebrate fossils, shall not be damaged, destroyed, removed, moved, or disturbed. If in connection with operations under this authorization any of the above resources are encountered the operator shall immediately suspend all activities in the immediate vicinity of the discovery that might further disturb such materials and notify the BLM of the findings. The discovery must be protected until notified to proceed by the BLM.

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

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

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

of the discovery, and the discovery shall be protected for 30 days or until notified by the BLM to proceed.

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

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

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

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

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

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

18. Visual Resources. Production facilities shall be placed to avoid or minimize visibility from travel corridors, residential areas, and other sensitive observation points—unless directed otherwise by the BLM due to other resource concerns—and shall be placed 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 BLM may direct that cleared trees and rocks be salvaged and redistributed over reshaped cut-and-fill slopes or along linear features.

Above-ground facilities shall be painted with BLM Standard Environmental Color **Shale Green** to minimize contrast with adjacent vegetation or rock outcrops.

19. Windrowing of Topsoil. Topsoil shall be windrowed around the pad perimeter to create a berm that limits and redirects stormwater runoff and extends the viability of the topsoil per BLM Topsoil Best Management Practices (BLM 2009 PowerPoint presentation available upon request from Glenwood Springs Field Office). Topsoil shall also be windrowed, segregated, and stored along pipelines and roads for later spreading across the disturbed corridor during final reclamation. Topsoil berms shall be promptly seeded to maintain soil microbial activity, reduce erosion, and minimize weed establishment.
20. Reserve Pit. A minimum of 2 feet of freeboard shall be maintained in the reserve pit. Freeboard is measured from the highest level of drilling fluids and cuttings in the reserve pit to the lowest surface elevation of ground at the reserve pit perimeter.
21. Soils. Cuts and fills shall be minimized when working on erosive soils and slopes in excess of 30 percent. Cut-and-fill slopes shall be stabilized through revegetation practices with an approved seed mix shortly following construction activities to minimize the potential for slope failures and excessive erosion. Fill slopes adjacent to drainages shall be protected with well-anchored silt fences, straw wattles, or other acceptable BMPs designed to minimize the potential for sediment transport. On slopes greater than 50 percent, BLM personnel may request a professional geotechnical analysis prior to construction.

**DOWNHOLE CONDITIONS OF APPROVAL**  
**Applications for Permit to Drill**  
**Company/Operator: Encana Oil & Gas (USA) Inc. (Mamm Creek Field)**

<b>List of Wells – MCU N22W Pad, SESW-22-7-93</b>		
<i>Proposed Wells</i>	<i>Surface Locations</i>	<i>Bottomhole Locations</i>
MCU 22-13A	SE SW 22 7S 93W	SW SW 22
MCU 22-13B	SE SW 22 7S 93W	SW SW 22
MCU 22-13C	SE SW 22 7S 93W	SW SW 22
MCU 22-14A	SE SW 22 7S 93W	SE SW 22
MCU 22-14B	SE SW 22 7S 93W	SE SW 22
MCU 22-14C	SE SW 22 7S 93W	SE SW 22

1. Twenty-four hours *prior* to (a) spudding, (b) conducting BOPE tests, (c) cementing/running casing strings, and (d) within 24 hours *after* spudding, the CRVFO shall be notified. One of the following CRVFO inspectors shall be notified by phone. The contact number for all notifications is: 970-876-9064. The BLM CRVFO inspectors are Julie King, Lead PET; David Giboo, PET; Greg Rios, PET; Alan White, PET; and Tim Barrett, PET.
2. A CRVFO petroleum engineer shall be contacted for a verbal approval prior to commencing remedial work, plugging operations on newly drilled boreholes, changes within the drilling plan, sidetracks, changes or variances to the BOPE, deviating from conditions of approval, and conducting other operations not specified within the APD. Contact, Bob Hartman at 970-244 3041 (office) or 970-210-2374 (cell) for verbal approvals.
3. If a well control issue or failed test (e.g. kick, blowout, water flow, casing failure, or a bradenhead pressure increase) arises during drilling or completions operations, Bob Hartman at 970-244 3041 (office) or 970-210-2374 (cell) shall be notified within 24 hours from the time of the event. IADC/Driller’s Logs and Pason Logs (mud logs) shall be forwarded to CRVFO – Petroleum Engineer, 2300 River Frontage Road, Silt, CO 81652 within 24 hours of a well control event.
4. The BOPE shall be tested and conform to Onshore Order No. 2 for a **5M** system and recorded in the IADC/Driller’s log. A casing head rated to 5,000 psi or greater shall be utilized.
5. An electrical/mechanical mud monitoring equipment shall be function tested prior to drilling out the surface casing shoe. As a minimum, this equipment shall include a trip tank, pit volume totalizer, stroke counter, and flow sensor.
6. Prior to drilling out the surface casing shoe, gas detecting equipment shall be installed in the mud return system. The mud system shall be monitored for hydrocarbon gas/pore pressure changes, rate of penetration, and fluid loss.
7. A gas buster shall be functional and all flare lines effectively anchored in place, prior to drilling out the surface casing shoe. The discharge of the flare lines shall be a minimum of 100 feet from the wellhead and targeted at bends. The panic line shall be a separate line (not open inside the buffer tank) and effectively anchored. All lines shall be downwind of the prevailing wind direction and directed into a flare pit, which cannot be the reserve pit. The flare system shall use an automatic

ignition. Where noncombustible gas is likely or expected to be vented, the system shall be provided supplemental fuel for ignition and maintain a continuous flare.

8. After the surface/intermediate casing is cemented, a Pressure Integrity Test/Mud Equivalency Test/FIT shall be performed on the first well drilled in accordance with OOGO No. 2; Sec. III, B.1.i. to ensure that the surface/intermediate casing is set in a competent formation. This is not a Leak-off Test, but a formation competency test, insuring the formation at the shoe is tested to the highest anticipated mud weight equivalent necessary to control the formation pressure to the next casing shoe depth or TD. Submit the results from the test via email (bhartman@blm.gov) on the first well drilled on the pad or any horizontal well and record results in the IADC log. Report failed test to Bob Hartman at 970-244 3041 (office) or 970-210-2374 (cell). A failed pressure integrity test is more than 10% pressure bleed off in 15 minutes.
9. As a minimum, cement shall be brought to 200 feet above the Mesaverde. After WOC for the production casing, a CBL shall be run to verify the TOC and an electronic copy in .las and .pdf format shall be submitted to CRVFO – Petroleum Engineer, 2300 River Frontage Road, Silt, CO 81652 within 48 hours. If the TOC is lower than required or the cement sheath of poor quality, a CRVFO petroleum engineer shall be notified for remedial operations within 48 hours from running the CBL and prior to commencing fracturing operations,

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

10. On the first well drilled on this pad, a triple combo open-hole log shall be run from the base of the surface borehole to surface and from TD to bottom of surface casing shoe. This log shall be in submitted within 48 hours in .las and .pdf format to: CRVFO – Todd Sieber, 2300 River Frontage Road, Silt, CO 81652. Contact Todd Sieber at 970-876-9000 or asieber@blm.gov for clarification.
11. Submit the (a) mud/drilling log (e.g. Pason disc), (b) driller's event log/operations summary report, (c) production test volumes, (d) directional survey, and (e) Pressure Integrity Test results within 30 days of completed operations (i.e. landing tubing) per 43 CFR 3160-9 (a).
12. Prior to commencing fracturing operations, the production casing shall be tested to the maximum anticipated surface treating/fracture pressure and held for 15 minutes without a 2% leak-off. If leak-off is found, Bob Hartman shall be notified within 24 hours of the failed test, but prior to proceeding with fracturing operations. The test shall be charted and set to a time increment as to take up no less than a quarter of the chart per test. The chart shall be submitted with the well completion report.
13. During hydraulic frac operations, monitor the bradenhead/casing head pressures throughout the frac job. Frac operations shall be terminated upon any sharp rise in annular pressure (+/- 40 psi or greater) in order to determine well/wellbore integrity. Notify BLM Bob Hartman at 970-244 3041 (office) or 970-210-2374 (cell) immediately.
14. Per 43 CFR 3162.4-1(c), not later than the 5<sup>th</sup> business day after any well begins production on which royalty is due anywhere on a lease site or allocated to a lease site, or resumes production in a case of a well which has been off production for more than 90 days, the operator shall notify the authorized officer by letter or sundry notice, Form 3160-5, or orally to be followed by a letter or sundry notice, of the date on which such production has begun or resumed.

## FONSI

### DOI-BLM-CO-N040-2012-0022-EA

The Environmental Assessment (EA) analyzing the environmental effects of the Proposed Action has been reviewed. The project design and approved mitigation measures result in a Finding of No Significant Impact (FONSI) on the environmental elements analyzed in this EA or incorporated by reference from EA #CO140-2004-102, approved on August 22, 2004. The current EA is tiered to the 2004 EA, pursuant to the National Environmental Policy Act (NEPA). Therefore, an Environmental Impact Statement (EIS) is not necessary to analyze further the environmental effects of the Proposed Action.

### DECISION RECORD

DECISION: It is my decision to approve the Proposed Action as described and analyzed in this EA. This decision will provide for the orderly, economical, and environmentally sound exploration and development of oil and gas resources on a valid Federal oil and gas lease.

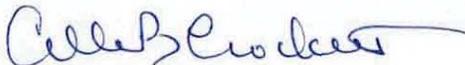
RATIONALE: The bases for this decision are as follows:

1. Approval of the Proposed Action is validating the rights granted with the Federal oil and gas leases to develop the leasehold to provide commercial commodities of oil and gas.
2. The environmental impacts would be avoided, minimized, or offset with the mitigation measures incorporated into the Proposed Action or attached and enforced by BLM as Conditions of Approval (COAs). This applies to the eleven environmental elements re-analyzed in the current EA and eight other elements for which the BLM has concluded that the 2004 EA remains adequate.
3. This Decision does not authorize the initiation of surface-disturbing activities on BLM lands or of drilling activities associated with any Federal oil and gas well. Initiation of activities related to the six new Federal oil and gas wells to be drilled from the existing N22W well pad may commence only upon approval by BLM of an Application for Permit to Drill (APD) submitted by Encana Oil & Gas (USA) Inc. Furthermore, no activities related to the drilling of the ten fee wells from the existing N22W well pad may commence until BLM approves the Surface Occupancy Sundry Notice.

MITIGATION MEASURES: Mitigation measures presented in Appendix A of this EA will be incorporated as COAs for both surface and drilling operations and attached to APDs for the Federal wells drilled on the existing N22W well pad

NAME OF PREPARER: Julie McGrew, Natural Resource Specialist

SIGNATURE OF AUTHORIZED OFFICIAL:



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

DATE: 2/6/12