



U. S. Department of the Interior
Bureau of Land Management
Colorado State Office

Glenwood Springs Energy Office

August 2007



**South Parachute Geographic Area Plan
for Oil and Gas Development
EA# CO140-2006-050**



Drafted by Arcadis G&M, Inc.
for
Glenwood Springs Energy Office
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EXECUTIVE SUMMARY

Project Proposal

EnCana Oil and Gas (USA) Inc. proposes to develop oil and gas resources in an area of approximately 4,820 acres of Federal, private, and split-estate lands located three miles southeast of Rifle, Garfield County, Colorado. The proposed development plan, referred to as the South Parachute Geographic Area Plan (SPGAP), was prepared by the Bureau of Land Management (BLM), Glenwood Springs Energy Office (GSEO) to meet the requirements for an Environmental Assessment (EA) under the National Energy Policy Act (NEPA). The SPGAP was prepared based on information provided by EnCana and its consultants and on independent review and analysis by a BLM Interdisciplinary (ID) Team.

The proposed action put forth by EnCana and embodied in the SPGAP consists of drilling up to 139 wells from 16 existing well pads (two on private surface-split estate and 14 on Federal surface) and 10 new pads (one on private surface-split estate and nine on Federal surface). The bottomhole locations of the 139 wells would include 138 wells completed in Federal mineral estate and one well in private mineral estate. The drilling rate is expected to result in 9 wells being completed in 2007, with the remainder being completed within 2 to 3 years.

The ability of EnCana to reach the planned 139 bottomhole locations from a total of 26 pads (10 new, 16 existing) results from the use of directional drilling technology. Consequently, surface locations would be at a density of one pad per approximately 165 acres, or about 3.8 pads per square mile. Total surface disturbance from well pads construction would be approximately 40.9 acres, representing a range in pad size from 3.1 to 5.2 acres. Interim reclamation of the pads following completion of the wells would reduce the long-term area of surface disturbance to approximately 15 acres for the 10 new pads. One of the existing pads would need to be reconfigured to accommodate the new wells to be drilled there, resulting in an estimated 1.5 acres of new surface disturbance for the life of project.

Other ground-disturbing activities described in the SPGAP would include 5.7 miles of new access roads and 7.0 miles of new pipelines, 4.4 miles of which would be collocated with the new roads. The new roads and buried pipelines would be built within a 75-foot right-of-way (ROW), to be reduced to a 25-foot road surface following construction. An additional 2.6 miles of new pipeline would be built within a separate 55-foot. The initial disturbance of road and pipeline construction would be 62.1 acres. Long-term surface disturbance would be 21.8 acres.

Permanent surface facilities needed at each pad to support oil and gas development would include the wellheads, separation/dehydration units, and aboveground tanks for storage of condensate and produced water. Each pad would also have a "reserve pit" for the disposal of drill cuttings and miscellaneous drilling debris. Following completion of the wells at a pad, the reserve pit would have hydrocarbons and debris removed and would then be dried, backfilled, covered, and reclaimed. Produced water from the wells would be transported by truck or buried pipeline to EnCana's existing High Mesa water treatment facility or an approved disposal facility. Gas pipeline compressors are expected to be located at a centralized facility.

Following completion activities at a pad, areas not needed during production would be revegetated using reclamation methods, standards, and species specified by BLM. When all of the wells at a pad are no longer producing economic quantities of gas, the wells would be closed and abandoned, and the pad would undergo final reclamation.

Four of the nine leases that would be developed under the proposed action contain big game timing limitation (TL) stipulations that would restrict exploration, drilling, and development activities during

certain periods of the year. Three of the leases stipulate a 5-month TL from January 1 to May 31, while the TL period attached to another lease is for a 4-month period between January 1 and April 30. The remaining five leases, which are located in adjacent winter range, contain no TL stipulations and, thus, afford no protection to big game.

In order to provide uniform protection for all winter range within the SPGAP area, Encana, in consultation with the BLM and the Colorado Division of Wildlife (CDOW) has proposed a 60-day TL period from January 1 to March 1 applicable to all leases in the SPGAP area. This proposed change would require a modification of existing stipulations to reflect the shortened TL period. The 60-day TL period would be implemented through conditions of approval (COAs) on individual APDs for those leases that do not contain TL stipulations.

EnCana has also agreed to fund a tamarisk treatment project being coordinated and implemented by the Tamarisk Coalition, a not-for-profit organization. Funding would be used to support the mechanical, chemical and/or biological treatment of tamarisk and other forms of habitat restoration along the Colorado River floodplain generally west of Parachute, Colorado. The amount of funding which EnCana has committed would treat approximately 250 acres.

No Action Alternative

In order to provide a basis for comparison, the environmental impacts of implementing a no action alternative were also evaluated. In this case, “no action” means that the BLM would not approve any of the proposed developments on Federal surface or involving Federal mineral estate. Although there is only one private well proposed, that well would require granting of BLM rights-of-way (a Federal action). By definition, any action requiring Federal authorization would not be included in the no action alternative. Therefore, the No Action Alternative would involve the denial of the 139 APDs, the proposed roads and pipelines, and right-of-way grants that comprise the proposed action.

No additional road or pipeline construction would occur. The existing roads and pipelines in the South Parachute field would continue to serve the 18 existing well pads within the field.

Impacts and Mitigation

The estimated total surface disturbance under the proposed action would be approximately 107 acres (40.9 acres for pads and 62.1 acres for new roads and pipelines). Long-term disturbance would be approximately 33.8 acres. Protective surface use stipulations associated with the Federal leases include the following:

- Modification of Winter Timing Limitation (TL) to preclude exploration, drilling, and completion activities from January 1 through March 1 on all Federal leases in the SPGAP area.
- Winter TL to prohibit construction or drilling traffic from January 1 through March 1 on the Federal road and pipeline ROWs.
- TL precluding exploration, drilling or development activity from January 1 through August 31 within ¼ mile of active raptor nests.
- Controlled Surface Use (CSU) to protect fragile soils by requiring that certain performance objectives be met prior to construction.

Conditions of Approval (COAs) developed in conformance to these restrictions on surface use, or within the general authority for resource protections granted to BLM under 43 CFR 3101, are provided in Appendices E and F of the SPGAP. These COAs are mitigation measures addressing road construction and maintenance; dust abatement; reclamation; control of noxious weeds; protection of raptors, migratory birds, and wintering big game; protection of cultural resources; protection of paleontological resources; protection of surface water, including waters of the U.S.; and protection of visual resources. Downhole COAs (Appendix F) are also enforced by BLM to ensure that drilling operations protect prospectively valuable mineral resources and groundwater, including connected surface waters and domestic water wells.

Based on the existing site conditions of the SPGAP area, environmental consequences expected to result from the proposed action, the COAs presented in Appendices E and F, and applicable Federal and State standards for air quality, water quality, and hazardous materials management, the proposed action is not expected to result in significant impact levels for any environmental elements.

The no action alternative would involve no new surface disturbance. The only development occurring would be the continued operation of numerous existing producing wells of Federal jurisdiction within the South Parachute field. There would be additional environmental impacts anticipated under the no action alternative. However, this alternative would not meet the purpose and need for action. That is, the development of Federal leases for the purpose of increasing the availability of oil and gas resources to the public would not occur.

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FONSI
CO-140-2006-050 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) and rights-of-way associated with the wells and other developments identified in Tables 1, 2 and 3 of the Proposed Action with the Conditions of Approval identified in Appendices D, E, and F. 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 Appendices D, E, and F will be incorporated as Conditions of Approval for both surface and drilling operations.

PREPARED BY: Greystone (Arcadis G&M) Inc., Jim Byers, Natural Resource Specialist, BLM, and the Glenwood Springs Energy Office.

SIGNATURE OF PLANNING AND ENVIRONMENTAL COORDINATOR:



Planning and Environmental Coordinator

8/28/07
Date

SIGNATURE OF AUTHORIZED OFFICIAL:



Authorized Officer

8/28/07
Date

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INTRODUCTION

EnCana Oil & Gas (USA), Inc. (“EnCana”) is proposing a 2- to 3-year program of oil and gas development on approximately 4,820 acres of public, split estate, and private lands located in the Piceance Basin about 3 miles southeast of Parachute, Garfield County, Colorado (Appendix A, Figure 1). This proposal, referred to as the South Parachute Geographic Area Plan (SPGAP), arises from the implementation of the prior Battlement Mesa Plan of Development that successfully demonstrated the potential of the area to contain economically viable reserves of natural gas (USDI 1998).

The Department of the Interior, Bureau of Land Management, Glenwood Springs Energy Office (GSEO) administers the Federal mineral estate in the SPGAP area. The GSEO has prepared this environmental assessment (EA) in compliance with the National Environmental Policy Act (NEPA) according to the format established by the Council on Environmental Quality (CEQ) regulations that implement NEPA. This EA discloses the direct, indirect, and cumulative impacts of the development proposal (i.e., the proposed action) and a no action alternative, and determines whether significant environmental impacts necessitating an environmental impact statement (EIS) would occur.

The proposal consists of constructing, drilling, completing and operating up to 139 new wells from up to 16 existing and 10 new surface locations. Ancillary facilities connected to the project include access roads, gas and produced water pipelines, and a variety of surface production equipment locations. Included in the proposal is a range of mitigation measures designed to minimize or eliminate impacts to surface and downhole resources.

Purpose and Need for Action

The purpose of the action is to develop oil and gas resources on Federal leases COC 06266B, COC 010075A, COC 01523, COC 019572, COC 27823, COC 27825, COC 27826, COC 33291, and COC 67090 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.

Instead of structuring the development of these leases as a series of individual actions, the current Glenwood Springs Resource Area (GSRA) land use plan (USDI 1999a), in addition to more recent BLM policy, specify the use of multiple well development plan proposals to more effectively manage Federal lease development.

Issues

The CEQ regulations require an “early and open process for determining the scope of issues to be addressed and for identifying significant issues related to a Proposed Action” (40 CFR 1501.7). In order to satisfy this CEQ requirement, the BLM requested input from the public to determine their concerns with EnCana’s proposal and to develop alternatives or mitigation measures that respond to those issues.

A Public Notice requesting comments on the SPGAP was published in the Glenwood Post Independent on February 3, 10, and 17, 2006 and in the Rifle Citizen Telegram on February 2, 9 and 16, 2006. Additionally, a letter containing the public notice information was mailed directly to multiple state and Federal agencies, adjacent landowners, the Battlement Mesa Company, the Town of Parachute, Garfield County, the Colorado Mule Deer Association, and the Colorado Division of Wildlife (CDOW). The 30-day public comment period ended on February 27, 2006.

In response to the solicitation for comment identified in the Public Notice, BLM received comments from the CDOW, the Colorado Mule Deer Association, the Town of Parachute, the Garfield County Board of Commissioners, and various citizens of Battlement Mesa (Appendix B).

Concerns identified through the public participation process included:

- traffic use patterns, congestion and associated impacts (e.g., mud, noise, air quality)
- lighting, noise, and odor from drilling activity
- effects on big game and wildlife habitat
- erosion prevention
- use of best management practices
- interim reclamation methods

THE PROPOSED ACTION

The SPGAP is intended to describe a future development strategy given current market conditions and company constraints. If fully developed, this proposal would result in up to 139 bottomhole locations drilled at 26 surface locations (i.e., 16 existing pads and 10 new locations). If approved, EnCana expects to drill up to 9 wells in 2007 and an equal or greater number per year in subsequent years (i.e., up to the maximum of 139). However, the total number of wells drilled would depend largely on factors out of EnCana's control, such as geology, engineering technology, economic factors, availability of commodity markets, and lease stipulations and notices.

In light of these factors, all or any combination of the following development scenarios could ultimately be implemented:

- Sixteen existing well pads with 79 Federal wells and one fee well:
 - Fifteen Federal pads (PN20, PH25, PJ28, PL28, PA29, PF29, PN29, PA30, PB30, PD30, PG30, PJ30, PN30, PD31, PF31) drilling 76 Federal bottom holes
 - One Federal pad (PK25) drilling three Federal & one fee bottom holes
- Ten new well pads with total of 59 Federal wells:
 - Nine Federal surface pads (PI19, PM19, PK21, PB22, PG25, PH28, PA31, PN31, PN36,) drilling 55 Federal bottom holes
 - One split estate pad (PL30) drilling four Federal bottom holes

Associated with these developments would be the construction of up to 5.7 miles of new access roads with 4.4 miles of collocated pipelines and an additional 2.6 miles of separate pipeline (see Appendix A, Figure 1).

Full development of the proposed action does not preclude additional future developments on these Federal leases. It might reasonably be anticipated that additional developments could occur in the future – either within the SPGAP area or in offsite areas accessed by directional drilling techniques from pads in the SPGAP area – due to alterations in downhole spacing orders or changes in environmental, economic, or technological conditions.

The proposed development area encompasses approximately 4,820 acres, of which 4,161 acres are characterized by Federal surface and mineral ownership, and 475 acres are characterized by typical split estate (i.e., private surface and Federal mineral ownership) and 184 acres are characterized by private surface and mineral ownership (Appendix A, Figure 2).

Each major element of the proposed action is described below under the headings, **Development (Construction, Drilling, and Completion)**, **Production (Operation and Maintenance)**, **Abandonment and Reclamation**, and **Stipulation Modifications and Tamarisk Treatments**. The proposed elements contain a standard 13-Point Surface Use Plan (SUP) (Appendix C) and 10-Point Drilling Plans for gas well development (Appendix D). With the BLM's approval, all measures discussed in the SUP would be implemented as part of the proposed action. Any deviations from the standard practices below are identified in the standard and site-specific Conditions of Approval (COAs) (Appendices E and F).

Development – Construction, Drilling and Completion

During the course of development, numerous construction activities would be completed. All of these activities could occur simultaneously. The following is a description of construction methods proposed for well pads, access roads, and gas gathering and/or produced water pipelines.

The locations of the various developments reflect the results of onsite exams conducted by the BLM, the operator, and subcontractors to assess proposed pad and pit layout, proposed access routes, cuts and fills, topsoil stockpiling, erosion control, and reclamation potential. The primary purpose of the onsite inspections was to assess potential resource impacts associated with their construction. In some cases, revisions to the design of the proposed developments were made to minimize potential impacts.

Construction

Proposed Well Pads

The proposed well pads would be constructed from the native soil and rock materials present using a bulldozer, grader, front-end loader, or backhoe. The pad would be constructed by clearing vegetation, stripping and stockpiling topsoil, and leveling the pad area using cut-and-fill techniques. All cut slopes associated with pad construction would be "step cut" and left rough to provide catchments for seeds and moisture. The tops of the cut banks and pad corners may be rounded to improve their appearance. EnCana's stormwater management policy may include additional engineering measures such as the construction of drainage systems and the installation of culverts, to prevent erosion and sediment loading.

Initially, the size of the newly constructed pads would range from 3.1 to 5.2 acres (Table 1). The variation in the size of the pads is a function of topography and the number of bottomhole locations targeted. The construction of the 10 proposed pads would result in an estimated 40.9 acres of new surface disturbance.

On each pad, reserve pits could be excavated to contain drilling fluids. Given the variation in the size and dimensions of the proposed well pads and the number of proposed wells that may be drilled at any given location, the size of the reserve pits would vary. In order to safely contain cuttings and drilling fluids, the reserve pits would be constructed to allow for a minimum of 2 feet of freeboard between the maximum fluid level and the top of the berm around the pit. In addition to the berm, catchments would be excavated around the pits to prevent the infiltration of stormwater. The fluids contained in the pits would be allowed to evaporate unless an alternative method of disposal is approved.

A fence would be constructed around each pit to protect wildlife. The fence would remain until all wells have been drilled and completed.

Table 1. Disturbance Associated with Proposed Well Pads, Access Roads, and Pipelines.

Well Pads	Mineral Lease	Short-term Pad Disturbance (acres)	Length of Associated Road and Pipeline (miles)		Short-term Road and Pipeline Disturbance (acres)	Short-term Disturbance (acres)	Total Long-term Disturbance (acres)
			Road	Pipeline			
Existing PJ30 Reconstruction	COC06266B	4.0	0.0	0.1	0.6	4.6	1.5
PI19	COC01523	4.5	1.2	1.4	7.1	11.6	5.1
PK21	COC01523	4.9	0.7	1.0	6.7	11.6	3.6
PB22	COC01523	3.8	0.3	0.6	3.7	7.5	2.7
PH28	COC01523	3.2	0.6	0.4	5.9	9.1	3.2
PL30	COC19572	4.4	0.2	0.2	2.1	6.5	2.2
PN31	COC27823	3.4	0.8	0.8	7.2	10.6	3.9
PG25	COC27825	3.1	0.3	0.3	2.6	5.7	2.4
PN36	COC27825	4.0	0.1	0.02	0.6	4.6	1.7
PM19	COC33291	4.4	1.0	N/A	9.9	14.3	4.5
PA31	COC33291	5.2	0.5	0.6	5.2	10.4	3.0
New pipeline serving existing PA29 Pad	COC01523	N/A	N/A	1.0	6.6	6.6	0.0
New pipeline serving existing PA30 Pad	COC01523	N/A	N/A	0.6	3.9	3.9	0.0
Totals		40.9	5.7	7.0	62.1	107.0	33.8

Notes:

- Long-term road disturbance width was estimated at 25 feet for roads – pipelines are assumed to be reclaimed resulting on no long-term disturbance. Long-term disturbance area for pads was estimated at 1.5 acre/pad.
- Well pad disturbance area and road & pipeline lengths for each pad were taken from survey plats provided by Wasatch Surveying of Evanston, WY in January, 2007.
- For pipelines located alongside roads, 75-foot short-term disturbance width was used.
- For pipelines located separately, 55-foot short-term disturbance width was used.

After all wells are drilled, completed, and production facilities installed at each pad, interim reclamation activities would begin. Generally, cuts would be revegetated and fills recontoured to blend in with adjacent natural slopes and seeded to reestablish vegetation. These interim reclamation techniques would reduce the amount of surface disturbance from the 40.9 acres associated with initial pad construction to an estimated 16.5 acres (11 pads at 1.5 acres per pad).

Existing Well Pads

The 16 existing well pads were constructed using the same general methodology as proposed for the new pads. The development of the wells proposed for 15 of the 16 locations would not require new surface disturbance. The development of two proposed wells on the existing PJ30 pad would require pad reconstruction that would disturb 4 acres (see Table 1). The development of the existing wells pads on Federal surface or involving Federal mineral estate (i.e., PN20, PH25, PK25, PJ28, PL28, PA29, PF29, PN29, PA30, PB30, PD30, PG30, PN30, PD31, and PF31) would be subject to the same mitigation measures as described for the proposed well pads.

It is assumed that the existing well footprint would suffice for the proposed wells or that the proposed wells will satisfy language presented in BLM Washington Office Instruction memorandum No. 2005-247 (dated 9/30/05) which states:

“Additional disturbance or expansion of the existing well pad is not restricted as long as it is tied to the original location or well pad. This provision does not extend to new well sites merely in the general vicinity of the original location or well pad.”

Table 2. Existing Well Pads.			
<i>Well Pad</i>	<i>Mineral Lease</i>	<i>Legal Description</i>	<i>Surface Ownership</i>
PA29	COC01523	T7S R95W Sec 29 Lot 1	BLM
PA30	COC01523	T7S R95W Sec 30 Lot 3	BLM
PB30	COC19572	T7S R95W Sec 30 Lot 4	Daybreak Realty
PF29	COC01523	T7S R95W Sec 29 SENW	BLM
PJ28	COC01523	T7S R95W Sec 28 NWSE	BLM
PL28	COC01523	T7S R95W Sec 28 NWSW	BLM
PN20	COC01523	T7S R95W Sec 20 SESW	BLM
PN29	COC01523	T7S R95W Sec 29 SESW	BLM
PJ30	COC06266B	T7S R95W Sec 30 SWSE	BLM
PN30	COC010075A	T7S R95W Sec 30 SESW	BLM
PD30	COC19572	T7S R95W Sec 30 Lot 6	BLM
PG30	COC19572	T7S R95W Sec 30 SWNE	Daybreak Realty
PD31	COC27823	T7S R95W Sec 31 Lot 3	BLM
PF31	COC27823	T7S R95W Sec 31 SENW	BLM
PH25	COC27825	T7S R96W Sec 25 SENE	BLM
PK25	COC27826	T7S R96W Sec 25 NESW	BLM

Proposed Access Roads

Access to the SPGAP area would be available from two directions. Vehicles could either travel west from Parachute on a frontage road to Una Bridge, take Garfield County Road (CR) 300 east to EnCana’s development road crossing private property. Another access route to the Battlement Creek portion of SPGAP would involve traveling east on CR302 or CR303 from Battlement Mesa.

Within the project area, the road network would extend from existing field development roads up Dry Creek and onto High Mesa (see Appendix A, Figures 1 and 2). The extension of the road network would involve the construction of approximately 5.7 miles of new roads. The roads would be constructed or upgraded to meet standards for the anticipated traffic flow and all-weather requirements. Prior to construction, the roadway would be cleared of any snow cover and allowed to dry completely. Road construction or improvements would not be allowed during muddy conditions. Should mud holes develop, they would be filled as soon as possible.

Roads and the majority of gathering pipelines would be constructed within a 75-foot disturbance corridor, which would be reduced to a 25-foot finished road surface (including bar ditch) after interim reclamation (see Table 1). Earth-moving equipment would first clear vegetation and topsoil from the pipeline corridor. The roads would then be constructed using standard equipment and techniques approved by the BLM, which could include excavating, ditching, draining, crowning, surfacing, sloping, and dipping the roadbed as necessary. The average road grade would be 10% or less, wherever possible. The 10% grade would only be exceeded in areas where physical terrain or unusual circumstances require it. Minimum horizontal curve radii would be 100 feet. Where terrain would not allow a 100-foot curve radius, the curve would be widened. Road construction would result in approximately 51.8 acres of short-term ground disturbance. Following interim reclamation, the long-term surface disturbance would be approximately 17.3 acres.

Where required, drainage crossings would be designed to minimize siltation and the accumulation of debris in the drainage crossing. Water diversions including cut-outs would be placed at frequent intervals along access roads to prevent the erosion of drainage ditches, as described in the *Surface Operating Standards for Oil and Gas Exploration & Development* (USDI and USDA 2006)

The access roads would be inspected and maintained on a quarterly basis, at a minimum, and could include such actions as:

- grading of the road surface
- cleaning relief ditches, culverts, and cattle guards
- implementing supplemental erosion control measures
- closing roads in periods of excessive soil moisture
- implementing road and slope stabilization measures
- conducting weed control
- applying dust abatement measures.

Many existing roads and a few proposed roads within the SPGAP area cross lease boundaries. By regulation, the operator must obtain a BLM right-of-way (ROW) for any road segment that leaves the lease it serves and for any directional wells that would reach into fee minerals from a Federal surface well pad. In recent years, EnCana has obtained necessary pipeline rights-of-way for their present gathering system. The proposed action would also include the authorization of numerous road and pipeline rights-of-way (Appendix A, Figure 3)

Proposed Gas Gathering and Water Pipelines

A gas gathering and produced water pipeline network would be needed to gather and deliver gas offsite to existing EnCana trunk pipelines and transport produced water to centralized tank batteries within and outside the project area.

Approximately 7.0 miles of pipelines would be installed as part of the proposed action (see Appendix A, Figure 1). About 4.4 miles of pipelines would be collocated with the access roads and would be buried within the 75-foot access road ROW. An additional 2.6 miles of pipeline, serving the PA29, PA30 and PH28 pads, would be constructed within a 55-foot ROW. Because they would be located with proposed access roads, the construction of the 4.4 miles of pipeline would result in no additional disturbance over the short-or long-term. The construction of the 2.6 miles of pipeline would result in approximately 17.3 acres of short-term surface disturbance, which would be eliminated after reclamation.

All pipelines would be buried to a minimum depth of 4 feet from surface to top of pipe. The pipeline trench would be excavated mechanically; pipe segments would then be welded together and tested, lowered into the trench, and covered with excavated material. Generally, a mile of pipeline would be constructed in 4 to 6 days.

Each pipeline would be pressure tested with fresh water and/or nitrogen gas to locate any leaks. Fresh water or nitrogen used for testing would be obtained offsite and transported to the testing location by truck. After testing, the water would be disposed of at an existing offsite evaporation pond facility, or discharged into surface water drainages if approved by the BLM and the State of Colorado. Nitrogen would be vented to the atmosphere if used instead of water.

Mitigation Common to All Construction Operations

All trees removed during construction activities would be cut to a maximum stump height of 6 inches, bucked into 4-foot lengths, and either stacked off location or windrowed to serve as silt barriers. Pinyon pine trees would be chipped, buried, or disposed of to prevent the spread of the pinyon *Ips* beetle. Rootballs would be buried, placed offsite, or scattered over the disturbed area as part of final reclamation. Other vegetation, such as sagebrush and other shrubs, may be scattered offsite or placed on well pad fills to help screen the pads. Cleared and grubbed juniper trees could be windrowed along toe of pad or road fill slopes, and placed back over pad and pipeline reclamation areas.

Drilling and Completion

Up to 139 wells would be drilled as part of the proposed action (Table 3). The number of wells proposed for drilling in 2007 is nine. Production results from these wells would be used to plan the 2008 and 2009 drilling programs.

EnCana's drilling operations would be conducted in compliance with all Federal Oil and Gas Onshore Orders, and all applicable rules and regulations. The drilling operation would be conducted in two phases. The first phase may use a small drilling rig to drill to a depth of approximately 630 to 1,500 feet or 50 feet below the base of any freshwater aquifers encountered. This surface hole would be cased with steel casing and cemented in place entirely from a depth of about 630 to 1,500 feet to ground level. This surface casing would serve the purposes of providing protection for any freshwater aquifers present and to contain pressure that may be encountered while drilling deeper. The BLM would be notified in advance of running surface casing and cement in order to witness these operations. This part of the drilling operation would normally take 2 to 3 days to complete.

Prior to drilling below the surface casing, a Blowout Preventer (BOP) would be installed on the surface casing, and both the BOP and surface casing would be tested for pressure integrity. The BOP and related equipment would meet the minimum requirements of Onshore Oil and Gas Order No. 2, and the BLM would be notified in advance of all pressure tests. Following the use of the surface-hole rig, if used, a larger drilling rig would be used to drill to target depths of about 6,700 to 9,700 feet. A downhole mud motor may be used to increase penetration rate. The rig would pump drilling fluids to drive the mud motor, cool the drill bit, and remove cuttings from the well bore.

In order to achieve borehole stability, minimize possible damage to the formations, provide adequate viscosity to carry the drill cuttings out of the well bore, and reduce downhole fluid losses, various non-toxic chemicals and certain materials may need to be added to the mud system.

Table 3. Surface and Bottomhole Locations of Proposed Wells.

<i>Lease</i>	<i>Pad Status</i>	<i>Proposed Wells</i>	<i>Surface Location (T7S, R95W)</i>	<i>Bottom Hole Location (T7S, R95W)</i>
COC 06266B	Existing PJ30 Reconstruct (Two wells)	Federal 30-9BB	Section 30, SW ¹ / ₄ SE ¹ / ₄	Section 30, 1500 FSL 660 FEL
		Federal 30-16		Section 30, 850 FSL 660 FEL
COC 010075A	Existing PN30 (Two wells)	Federal 30-9BB	Section 30, SE ¹ / ₄ SW ¹ / ₄	Section 30, 1500 FSL 660 FEL
		Federal 30-16		Section 30, 850 FSL 660 FEL
COC 01523	Proposed PI19 (Six wells)	Federal 19-9	Section 19, Lot 3	Section 19, 2150 FSL 660 FEL
		Federal 19-9BB		Section 19, 1500 FSL 660 FEL
		Federal 19-10		Section 19, 1780 FSL 1980 FEL
		Federal 19-10BB		Section 19, 2440 FSL 1980 FEL
		Federal 19-15BB		Section 19, 1120 FSL 1980 FEL
		Federal 20-12BB		Section 19, 2440 FSL 660 FWL
	Existing PN20 (Seven wells)	Federal 20-11	Section 20, SE ¹ / ₄ SW ¹ / ₄	Section 20, 2150 FSL 1980 FWL
		Federal 20-11BB		Section 20, 1500 FSL 1980 FWL
		Federal 20-13BB		Section 20, 1120 FSL 660 FWL
		Federal 20-14		Section 20, 850 FSL 1980 FWL
		Federal 20-14BB		Section 20, 200 FSL 1980 FWL
		Federal 20-15		Section 20, 460 FSL 1980 FEL
	Proposed PK21 (Five wells)	Federal 21-10	Section 21, NE ¹ / ₄ SW ¹ / ₄	Section 21, 1780 FSL 1980 FEL
		Federal 21-10BB		Section 21, 2440 FSL 1980 FEL
		Federal 21-11		Section 21, 2150 FSL 1980 FWL
		Federal 21-11BB		Section 21, 1500 FSL 1980 FWL
		Federal 21-15BB		Section 21, 1120 FSL 1980 FEL
	Proposed PB22 (Nine wells)	Federal 15-14	Section 22, Lot 3	Section 15, 850 FSL 1980 FWL
		Federal 15-14BB		Section 15, 200 FSL 1980 FWL
		Federal 15-15		Section 15, 460 FSL 1980 FEL
		Federal 15-15BB		Section 15, 1120 FSL 1980 FEL
		Federal 22-2		Section 22, 860 FNL 1980 FEL
		Federal 22-2BB		Section 22, 200 FNL 1980 FEL
		Federal 22-3		Section 22, 490 FNL 1980 FWL
		Federal 22-3BB		Section 22, 1150 FNL 1980 FWL
		Federal 22-6		Section 22, 1810 FNL 1980 FWL
	Proposed PH28 (Six wells)	Federal 27-5	Section 28, SE ¹ / ₄ NE ¹ / ₄	Section 27, 2180 FNL 660 FWL
		Federal 28-1		Section 28, 490 FNL 660 FEL
Federal 28-1BB		Section 28, 1150 FNL 660 FEL		
Federal 28-7BB		Section 28, 1520 FNL 1980 FEL		

Table 3. Surface and Bottomhole Locations of Proposed Wells.

<i>Lease</i>	<i>Pad Status</i>	<i>Proposed Wells</i>	<i>Surface Location (T7S, R95W)</i>	<i>Bottom Hole Location (T7S, R95W)</i>
COC 01523 Cont.		Federal 28-8		Section 28, 1810 FNL 660 FEL
		Federal 28-8BB		Section 28, 2470 FNL 660 FEL
	Existing PJ28 (Seven wells)	Federal 28-9	Section 28, NW¼SE¼	Section 28, 2150 FSL 660 FEL
		Federal 28-9BB		Section 28, 1500 FSL 660 FEL
		Federal 28-10BB		Section 28, 2440 FSL 1980 FEL
		Federal 28-14BB		Section 28, 200 FSL 1980 FWL
		Federal 28-15BB		Section 28, 1120 FSL 1980 FEL
		Federal 28-16BB		Section 28, 200 FSL 660 FEL
		Federal 28-16		Section 28, 850 FSL 660 FEL
	Existing PL28 (Seven wells)	Federal 28-5	Section 28, NW¼SW¼	Section 28, 2180 FNL 660 FWL
		Federal 28-6BB		Section 28, 2470 FNL 1980 FWL
		Federal 28-11		Section 28, 2150 FSL 1980 FWL
		Federal 28-11BB		Section 28, 1500 FSL 1980 FWL
		Federal 28-12BB		Section 28, 2440 FSL 660 FWL
		Federal 28-13		Section 28, 460 FSL 660 FWL
		Federal 28-13BB		Section 28, 1120 FSL 660 FWL
	Existing PA29 (Six wells)	Federal 28-5BB	Section 29, Lot 1	Section 29, 1520 FNL 660 FWL
		Federal 29-2		Section 29, 860 FNL 1980 FEL
		Federal 29-2BB		Section 29, 200 FNL 1980 FEL
		Federal 29-7		Section 29, 2350 FNL 1980 FEL
		Federal 29-7BB		Section 29, 1520 FNL 1980 FEL
		Federal 29-8		Section 29, 1710 FNL 660 FEL
	Existing PF29 (Six wells)	Federal 29-3BB	Section 29, SE¼NW¼	Section 29, 1150 FNL 1980 FWL
		Federal 29-5		Section 29, 2180 FNL 660 FWL
		Federal 29-5BB		Section 29, 1520 FNL 660 FWL
		Federal 29-6BB		Section 29, 2470 FNL 1980 FWL
		Federal 29-11		Section 29, 2150 FSL 1980 FWL
		Federal 29-12BB		Section 29, 2440 FSL 660 FWL
	Existing PN29 (Seven wells)	Federal 29-11BB	Section 29, SE¼SW¼	Section 29, 1500 FSL 1980 FWL
		Federal 29-13		Section 29, 460 FSL 660 FWL
		Federal 29-13BB		Section 29, 1120 FSL 660 FWL
		Federal 29-14		Section 29, 850 FSL 1980 FWL
Federal 32-3		Section 32, 490 FNL 1980 FWL		
Federal 32-4		Section 32, 860 FNL 660 FWL		
Federal 32-4BB		Section 32, 200 FNL 660 FWL		
Existing PA30	Federal 19-16	Section 30, Lot 3	Section 19, 850 FSL 660 FEL	
	Federal 19-16BB		Section 19, 200 FSL 660 FEL	

Table 3. Surface and Bottomhole Locations of Proposed Wells.

<i>Lease</i>	<i>Pad Status</i>	<i>Proposed Wells</i>	<i>Surface Location (T7S, R95W)</i>	<i>Bottom Hole Location (T7S, R95W)</i>
	(Four wells)	Federal 29-4		Section 29, 860 FNL 660 FWL
		Federal 29-4BB		Section 29, 200 FNL 660 FWL
COC 19572	Existing PB30 (Two wells)	Federal 19-15	Section 30, Lot 4	Section 19, 460 FSL 1980 FEL
		Federal 30-2		Section 30, 860 FNL 1980 FEL
	Existing PD30 (Six wells)	Federal 19-14BB	Section 30, Lot 6	Section 19, 200 FSL 1980 FWL
		Federal 30-3		Section 30, 490 FNL 1980 FWL
		Federal 30-3BB		Section 30, 1150 FNL 1980 FWL
		Federal 30-4BB		Section 30, 200 FNL 660 FWL
		Federal 30-5		Section 30, 2180 FNL 660 FWL
		Federal 30-5BB		Section 30, 1520 FNL 660 FWL
	Existing PG30 (Seven wells)	Federal 30-6	Section 30, SW ¹ / ₄ NE ¹ / ₄	Section 30, 1810 FNL 1980 FWL
		Federal 30-6BB		Section 30, 2470 FNL 1980 FWL
		Federal 30-7		Section 30, 2180 FNL 1980 FEL
		Federal 30-7BB		Section 30, 1520 FNL 1980 FEL
		Federal 30-8		Section 30, 1810 FNL 660 FEL
		Federal 30-8BB		Section 30, 2470 FNL 660 FEL
		Federal 30-10BB		Section 30, 2440 FSL 1980 FEL
	Proposed PL30 (Four wells)	Federal 25-9BB	Section 30, Lot 8	Section 25, 1500 FSL, 660 FEL
		Federal 30-12		Section 30, 1780 FSL 660 FWL
		Federal 30-12BB		Section 30, 2440 FSL 660 FWL
		Federal 3013BB		Section 30, 1120 FSL 660 FWL
	COC 27823	Existing PD31 (Four wells)	Federal 30-13	Section 31, Lot 3
Federal 31-3			Section 31, 490 FNL 1980 FWL	
Federal 31-4			Section 31, 860 FNL 660 FWL	
Federal 31-4BB			Section 31, 200 FNL 660 FWL	
Existing PF31 (Four wells)		Federal 31-3BB	Section 31, SE ¹ / ₄ NW ¹ / ₄	Section 31, 1150 FNL 1980 FWL
		Federal 31-5BB		Section 31, 1520 FNL 660 FWL
		Federal 31-6		Section 31, 1810 FNL 1980 FWL
		Federal 31-12BB		Section 31, 2440 FSL 660 FWL
Proposed PN31 (Six wells)		Federal 31-10	Section 31, SE ¹ / ₄ SW ¹ / ₄	Section 31, 1780 FSL 1980 FEL
		Federal 31-10BB		Section 31, 2440 FSL 1980 FEL
		Federal 31-14		Section 31, 850 FSL 1980 FWL
		Federal 31-14BB		Section 31, 200 FSL 1980 FWL
		Federal 31-15		Section 31, 460 FSL 1980 FEL
	Federal 31-15BB	Section 31, 1120 FSL 1980 FEL		
COC 27825	Proposed PG25	Federal 25-3BB	T7S, R96W Section 25, SW ¹ / ₄ NE ¹ / ₄	Section 25, 1150 FNL 1980 FWL
		Federal 25-6		Section 25, 1810 FNL 1980 FWL

Table 3. Surface and Bottomhole Locations of Proposed Wells.

<i>Lease</i>	<i>Pad Status</i>	<i>Proposed Wells</i>	<i>Surface Location (T7S, R95W)</i>	<i>Bottom Hole Location (T7S, R95W)</i>
COC 27825 Cont.	(Six wells)	Federal 25-6BB	T7S, R96W Section 25, SE¼NE¼	Section 25, 2470 FNL 1980 FWL
		Federal 25-7		Section 25, 2180 FNL 1980 FEL
		Federal 25-7BB		Section 25, 1520 FNL 1980 FEL
		Federal 25-10BB		Section 25, 2440 FSL 1980 FEL
	Existing PH25 (Five wells)	Federal 25-1		Section 25, 490 FNL 660 FEL
		Federal 25-1BB		Section 25, 1150 FNL 660 FEL
		Federal 25-8		Section 25, 1965 FNL 651 FEL
		Federal 25-8BB		Section 25, 2470 FNL 660 FEL
		Federal 25-9		Section 25, 2150 FSL 660 FEL
COC 27826	Existing PK25 (4 wells - Three Federal/ One fee)	Federal 25-11	T7S, R96W Section 25, NE¼SW¼	Section 25, 2150 FSL 1980 FWL
		Federal 25-12BB		Section 25, 2440 FSL 660 FWL
		Federal 25-13BB		Section 25, 1120 FSL 660 FWL
		EnCana 25-15BB		Section 25, 1120 FSL 1980 FEL
	Proposed PN36 (Three wells)	Federal 36-13BB	T7S, R96W Section 36, SE¼NW¼	Section 36, 1120 FSL 660 FWL
		Federal 36-14BB		Section 36, 200 FSL 1980 FWL
		Federal 36-15BB		Section 36, 1120 FSL 1980 FWL
COC 33291	Proposed PM19 (Seven wells)	Federal 19-11	Section 19, Lot 4	Section 19, 2150 FSL 1980 FWL
		Federal 19-11BB		Section 19, 1500 FSL 1980 FWL
		Federal 19-12		Section 19, 1780 FSL 660 FWL
		Federal 19-12BB		Section 19, 2440 FSL 660 FWL
		Federal 19-13		Section 19, 460 FSL 660 FWL
		Federal 19-13BB		Section 19, 1120 FSL 660 FWL
		Federal 19-14		Section 19, 850 FSL 1980 FWL
	Proposed PA31 (Seven wells)	Federal 30-16BB	Section 31, NE¼NE¼	Section 30, 200 FSL 660 FEL
		Federal 31-1		Section 31, 490 FNL 660 FEL
		Federal 31-1BB		Section 31, 1150 FNL 660 FEL
		Federal 31-2		Section 31, 860 FNL 1980 FEL
		Federal 31-7BB		Section 31, 1520 FNL 1980 FEL
		Federal 31-8		Section 31, 1810 FNL 660 FEL
		Federal 31-8BB		Section 31, 2470 FNL 660 FEL
COC 67090	Existing PH-1	None Proposed	T8S R96W Section 1 SE¼NE¼	2 Existing Wells on Pad

For the directional wells, an S-shaped directional design would be used to reach the targeted bottomhole locations. In general, a target radius of 200 feet would be used. Specific directional plans for each well will be included with the APDs. Downhole operations would be done with tools to facilitate proper direction and path of the well.

All well pads would have a lined reserve pit to receive the drill cuttings from the well bore (e.g., shale, sand, and miscellaneous rock minerals) and drilling fluids carried over with the cuttings. No hazardous substances would be placed in the pit. Frac pits to contain water used in the completion process would be planned for each new pad location in this GAP. Frac pits would be lined.

Compliance with Onshore Order No. 1 would determine the timing and closure of frac pits. In instances where well drilling would occur in more than one drilling season on a pad, the frac pit would be drained dry prior to winter shutdown period or before the expiration of the 90-day period as mandated by Onshore Order No. 1, whichever occurs first.

After drilling the hole to its final depth, logging tools would be run into the well to evaluate the potential hydrocarbon resource. If the evaluation indicates adequate hydrocarbon resources are present and recoverable, steel production casing would be run and cemented into place in accordance with the well design as approved by the BLM and any applicable Conditions of Approval (COAs). The proposed casing and cementing program would be designed to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. BLM approval is required prior to the use of any isolating medium other than cement.

After production casing has been cemented in place, the drilling rig would be removed, and a completion rig would be moved in. Well completion consists of running a Cement Bond log to evaluate cement integrity and to correlate the cased hole logs to the open hole logs. The casing is then perforated across the hydrocarbon producing zones, and the formation is stimulated to enhance the production of oil and gas. The typical method used for stimulation consists of a hydraulic fracture treatment in which sand and non-toxic fluids are pumped into the producing formation with sufficient pressure to fracture the rock formation. The sand serves as a propellant to keep the created fracture open, thereby allowing reservoir fluids to move more efficiently into the well bore.

A natural gas well in this GAP would require about 14-19 days to drill and approximately 30-45 days to complete. Pads with multiple well bores would be occupied for a more extended period of time, depending on the number of well bores. When possible, all well bores planned on individual pads would be drilled and completed within one drilling season and the pad reclaimed. If, due to the exploratory nature of this GAP, all well bores are not drilled, EnCana may request approval to leave the pad and pits open until the following drilling season. If granted, all pits would be pumped dry, the liner removed, and the pit fenced.

Production – Operation and Maintenance

Surface Facilities

Surface facilities at each well pad location would consist of wellheads, separation/dehydration units, and aboveground condensate and produced water tanks with approximately 300- to 400-barrel capacities. Multi-well locations would share production equipment, whenever feasible, to minimize surface occupancy/disturbance. All production equipment would be painted to match the surrounding terrain and located to reasonably minimize visual impact. BLM would select the color for all facilities, including containment rings, at sites associated with Federal surface or with the development of Federal mineral estate. In situations where both the surface and mineral estate are privately held, the BLM would recommend colors to the landowner.

The production equipment would be fenced within a 45-foot by 25-foot area to prevent contact with wildlife and livestock. Telemetry equipment would be used to remotely monitor well

conditions after a reasonable level of development. Telemetry would minimize traffic to/from well locations. Automated tank gauging would be employed to minimize the risk of spills.

Tank batteries would be placed within secondary containment to prevent the offsite migration of accidentally spilled condensate or produced water. Secondary containment would consist of corrugated steel containment berms or earthen berms. Compaction and construction of earthen berms surrounding the tank batteries would be performed to prevent lateral movement of fluids through the utilized materials. Secondary containment would be sized to contain a minimum of 110 percent of the storage capacity of the largest tank within the berm. All loading lines would be placed inside the containment berm.

Centralized compression would take place when possible to minimize the area impacted by compressor noise. If production requirements make onsite compression necessary, a Sundry Notice (Form 3160) would be submitted for approval to the authorized officer detailing specifications prior to installation of compressors.

Produced water may be confined to the reserve pit for a period of 90 days after initial production. Produced water at well pads would be transported by truck or buried pipeline to EnCana's existing High Mesa water treatment facility in the South Parachute Field, and/or trucked offsite to an approved disposal facility. Condensate would be transported to market by tanker trucks.

Interim Reclamation

After completion activities, EnCana would reduce the size of the well pad to the minimum surface area needed for production facilities and future workovers, while providing for reshaping and stabilization of cut-and-fill slopes. In brief, interim reclamation would be accomplished by grading, leveling, and seeding, as recommended by the BLM. Interim reclamation would reduce the disturbed area at each pad to approximately 1.5 acres after well development.

The following is a summary of interim reclamation activities that would take place immediately after well completion:

- The well location and surrounding areas(s) would be cleared of all debris, materials, and trash not required for production. Other waste and spoil materials would be disposed of at a local landfill.
- All pits, cellars, rat holes, and other boreholes not necessary for further lease operations, excluding the reserve pit, would be back-filled immediately to conform to surrounding terrain. Pits, cellars, rat holes, and other boreholes required for further lease operations would be fenced.
- Any hydrocarbons in the reserve pit would be removed in accordance with 43 CFR 3162.7. The reserve pit would then be completely dried and all cans, barrels, pipe, etc. would be removed. The accessible portion of pit liner would be removed to the local landfill and the remaining buried part of liner would be backfilled in place with native soils and materials. The backfilling of the reserve pit would be done in such a manner that the mud and associated solids would be confined to the pit and not squeezed out and incorporated into the surface materials. The backfilled pit would be covered with a minimum of 3 feet of overburden. When work is complete, the pit area would support heavy equipment without sinking.

- Areas not necessary for production and future workovers would be reshaped to resemble the original landscape contour. Stockpiled topsoil would be redistributed and disked on the area to be reclaimed and reseeded according to BLM recommendations. In the case of private surface and mineral locations, a seed mixture would be recommended to the landowner.

Interim reclamation would be completed within 90 days from the date of well completion, weather permitting. Dry or non-producing well locations would be plugged, abandoned and reclaimed within 90 days of well completion, weather permitting.

Some locations would require special reclamation practices. These practices could include hydromulching, straw mat application, fertilizing, seedbed preparation, contour furrowing, watering, terracing, water barring, and topsoil replacement. In order to prevent grazing pressure, pads would be fenced for the first two growing seasons or until the seeded species have established.

Workovers or Recompletion

Periodically, the workover or recompletion of a well may be required to ensure that efficient production is maintained. Workovers can include repairs to the well bore equipment (e.g., casing, tubing, rods, or pump), the wellhead, or the production facilities. These repairs would usually be completed during daylight hours. The frequency of this type of work cannot be accurately projected because workovers vary from well to well; however, an average may be one workover per well per year for a period of 7 days. In the case of multi-well pads, space for equipment would usually be limited to the “in-use” (i.e., disturbed) area of the surface location, although it is possible that interim reclamation could be delayed by workover operations. In the case of a well recompletion, a reserve pit may have to be constructed.

Abandonment and Reclamation

Well and Pipeline Plugging and Abandonment

Upon abandonment, each borehole would be plugged, capped, and its related surface equipment removed. Subsurface pipelines would be plugged at specific intervals. A Sundry Notice would be submitted by the operator to the BLM that describes the engineering, technical, or environmental aspects of final plugging and abandonment. This notice would describe final reclamation procedures and any mitigation measures associated with the final reclamation performed by the operator. The BLM and Colorado Oil & Gas Conservation Commission (COGCC) standards for plugging would be followed. A configuration diagram, a summary of plugging procedures, and a job summary with techniques used to plug the well bore (e.g., cementation) would be included in the Sundry Notice.

Final Reclamation

All surface disturbances would be recontoured and revegetated in accordance with the GSRA reclamation policy, including control of noxious weeds (USDI 1999b). One of EnCana’s goals is to accomplish as much reclamation during the life of the well as possible, even on those pads with a large final reclamation or “in use” area. Unreclaimed areas or reclaimed areas that do not meet the objective of 3-to-4 years of sustained reclamation (i.e., operator complete) would undergo the reclamation retreatment measures described in the 13-Point Surface Use Plan (Appendix C).

EnCana would restore the well locations and access roads to approximately their original contours. During reclamation of these sites, fill material would be pushed into cuts and over the backslope. No depressions would be left that would trap water or form ponds. Upon completion of backfilling, leveling and recontouring, the stockpiled topsoil would be evenly spread over the reclaimed areas(s). All disturbed surfaces would be reseeded with a seed mixture approved or recommended by the BLM. The seedbed would then be prepared by disking and roller packing following the natural contours. Seed would be drilled on contours at a depth no greater than 0.5 inch. In areas that cannot be drilled-seeded, seed would be broadcast-seeded at double the seeding rate and harrowed into the soil. All seeding would be conducted after September 1 and prior to ground frost. Spring seeding would be conducted after the frost leaves the ground but no later than May 15. If the seeding is unsuccessful, EnCana may be required to make subsequent seedings.

Reclamation would be considered successful when the objectives described in the GSRA reclamation policy are achieved. To summarize these objectives, revegetation would be considered successful when the following objectives are met:

- *Immediate short term:* Establishment of desirable perennial vegetation by end of the second growing season, capable of renewing itself.
- *Acceptable establishment:* Acceptable level of desirable vegetation by the end of the fifth growing season.
- *Long-term establishment:* Level of revegetation approximates the original, pre-disturbance condition, in terms of canopy cover and species composition.

Stipulation Modifications and Tamarisk Treatments

In order to protect big game winter range, four of the nine leases that would be developed under the proposed action contain timing limitation (TL) stipulations that would restrict exploration, drilling, and development activities during certain periods of the year. Federal leases COC27823, COC27825, and COC27826 stipulate a 5-month TL from January 1 to May 31, while the TL period attached to Federal lease COC33291 is for a 4-month period between January 1 and April 30 (Table 4). The remaining five leases (COC06266B, COC010075A, COC01523, COC019572, and COC67090), which are located in adjacent winter range, contain no TL stipulations.

Various levels of restriction within a single development area are undesirable for two reasons:

- The level of protection afforded by the TL stipulation would be ineffective because the operator could simply move their development activities to adjacent areas were there are no restrictions in place.
- The inconsistent periods of restriction would greatly complicate the scheduling and coordination of the proposed development activities.

In view of these complexities, Encana, in consultation with the BLM and the Colorado Division of Wildlife (CDOW) has proposed a 60-day TL period from January 1st to March 1st applicable to all leases in the SPGAP area. During this period, no exploration, drilling, or development activities could take place, although operations and maintenance activity would be permissible.

This proposed change would require a modification of existing stipulations on Federal leases COC 27823, COC 27825, COC 27826, and COC 33291 to reflect the shortened TL period. As

proposed, the modifications would be effective for a 3-year period or until the SPGAP is fully implemented, whichever comes first. After this time, the modifications would expire and the TL would revert to their originally stipulated periods. The 60-day TL period would be implemented on Federal leases COC 06266B, COC 010075A, COC 01523, COC 019572, and COC 67090 through conditions of approval (COAs) on individual APDs.

Modifying the TL to a uniform 4-or 5- month period across the SPGAP area could not be considered because these restrictions were not attached to Federal leases COC 06266B, COC 010075A, COC 01523, COC 019572, and COC 67090 when they were originally issued. As such, these restrictions would be inconsistent with existing surface use rights associated with these leases. Under 43 CFR 3101.1-2, the maximum period that surface-disturbing activities can be restricted under standard lease terms is 60 days.

In concert with the stipulation modifications, EnCana has proposed to fund a tamarisk treatment project being coordinated and implemented by the Tamarisk Coalition, a not-for-profit organization. Funding would be used to support the mechanical, chemical and/or biological treatment of tamarisk and other forms of habitat restoration along the Colorado River floodplain generally west of Parachute, Colorado. The amount of funding which EnCana has committed would treat approximately 250 acres.

SUMMARY OF LEASE STIPULATIONS

Five of the nine Federal oil and gas leases associated with the proposed action include stipulations or lease notices intended to protect natural resource values (Table 4). Although no special stipulations or notices are included on the remaining four leases, any protective measures deemed appropriate by the authorized officer could be applied to developments on these leases through the application of COAs on individual APDs.

Table 4. Summary of Lease Stipulations within the SPGAP Area.		
<i>Lease Number</i>	<i>Description of Lands within SPGAP Area</i>	<i>Lease Stipulations</i>
COC06266B (1955)	T.7S., R.95W., Section 30: N½SE¼, SE¼SE¼ 120 acres	No specific stipulations are listed on the lease.
COC010075A (1955)	T. 7S., R.95W., Section 30: Lots 6, 9, SE¼SW¼, SW¼SE¼ 156.97 acres	No specific stipulations are listed on the lease.
COC01523 (1951)	T.7S., R.95W., Section 19: E½SE¼, Section 20: SE¼SW¼, Section 21: E½, NE¼SW¼, Section 22: Lots 2, 3, 4, 5, 8, 9, 10, 11, Section 27: Lots 2, 4, 5, SW¼NW¼, W½SW¼, SE¼SW¼, S½NE¼SW¼, Section 28: Lots 1, 2, S½N½, S½, Section 29: All, Section 30: Lot 3, SE¼NE¼ 2289.22 acres (in SPGAP area)	No specific stipulations are listed on the lease.

<p>COC019572 (1951)</p>	<p>T.7S., R. 95W. Section. 19: Lot 3, E½SW¼, W½SE¼, Section 30: Lots 4, 5, 7, 8, SE¼NW¼, NE¼SW¼, SW¼NE¼</p> <p>475.2 acres</p>	<p>No specific stipulations are listed on the lease.</p>
<p>COC27823 (1979)</p>	<p>T.7S., R. 95W., Section 31: Lots 3, 4, 5, 6, W½NE¼, SE¼NE¼, E½W½, SE</p> <p>592.8 acres</p>	<p>Timing Limitation: No exploration, drilling or development activity from 1/1 – 5/31 in order to protect wildlife habitat.</p> <p>Timing Limitation: No exploration, drilling or development activity within ¼ mile of active raptor nest (4/1 – 8/31). Limitations do not apply to maintenance and operation of producing wells. Exceptions may be granted.</p> <p>Surface Disturbance: The plan of operation must assure adequate protection of drainages, waterbodies, springs, or fish and wildlife habitat, steep slopes or fragile soil. The lessee agrees that during periods of adverse conditions due to the climactic factors such as thawing, heavy rains, or flooding, all activities creating irreparable or extensive damage, as determined by the surface managing agency, will be suspended or the plan of operation modified and agreed upon.</p>
<p>COC27825 (1979)</p>	<p>T.7S., R. 96W., Section 25: N½</p> <p>320 acres</p>	<p>Timing Limitation: No exploration, drilling or development activity from 1/1 – 5/31 in order to protect wildlife habitat.</p> <p>Timing Limitation: No exploration, drilling or development activity within ¼ mile of active raptor nest (4/1 – 8/31). Limitations do not apply to maintenance and operation of producing wells. Exceptions may be granted.</p> <p>Surface Disturbance: The plan of operation must assure adequate protection of drainages, waterbodies, springs, or fish and wildlife habitat, steep slopes or fragile soil. The lessee agrees that during periods of adverse conditions due to the climactic factors such as thawing, heavy rains, or flooding, all activities creating irreparable or extensive damage, as determined by the surface managing agency, will be suspended or the plan of operation modified and agreed upon.</p>
<p>COC27826 (1979)</p>	<p>T.7S., R. 96W., Section 25: N½S½, SW¼SW¼, Section 36: SE¼SW¼, S½SE¼</p> <p>320 acres</p>	<p>Timing Limitation: No exploration, drilling or development activity from 1/1 – 5/31 in order to protect wildlife habitat.</p> <p>Timing Limitation: No exploration, drilling or development activity within ¼ mile of active raptor nest (4/1 – 8/31). Limitations do not apply to maintenance and operation of producing wells. Exceptions may be granted.</p>

		<p>Surface Disturbance: The plan of operation must assure adequate protection of drainages, waterbodies, springs, or fish and wildlife habitat, steep slopes or fragile soil. The lessee agrees that during periods of adverse conditions due to the climactic factors such as thawing, heavy rains, or flooding, all activities creating irreparable or extensive damage, as determined by the surface managing agency, will be suspended or the plan of operation modified and agreed upon.</p>
<p>COC33291 (1981)</p>	<p>T.7S., R. 95W., Section 19: Lot 4, Section 31: NE$\frac{1}{4}$NE$\frac{1}{4}$ Section 32: N$\frac{1}{2}$N$\frac{1}{2}$</p> <p>238.13 acres</p>	<p>Timing Limitation: No exploration, drilling or development activity from 1/1 – 4/30 in order to protect wildlife habitat. Limitations do not apply to maintenance and operation of producing wells. Exceptions may be granted.</p> <p>Surface Disturbance: The plan of operation must assure adequate protection of drainages, waterbodies, springs, or fish and wildlife habitat, steep slopes or fragile soil. The lessee agrees that during periods of adverse conditions due to the climactic factors such as thawing, heavy rains, or flooding, all activities creating irreparable or extensive damage, as determined by the surface managing agency, will be suspended or the plan of operation modified and agreed upon.</p>
<p>COC67090 (1995)</p>	<p>T.7S., R. 96W., Section 1: Lot 1, SE$\frac{1}{4}$NE$\frac{1}{4}$, NE$\frac{1}{4}$SE$\frac{1}{4}$</p> <p>120 acres</p>	<p>Lease Notice: inventory of fossil resources may be required if present.</p> <p>Lease Notice: inventory of biological and/or botanical resources may be required if present.</p>

THE NO ACTION ALTERNATIVE

The proposed action involves Federal subsurface minerals that are encumbered with Federal oil and gas leases, which grant the lessee a 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, therefore, none of the proposed developments described in this GAP would take place. However, wells that are currently in production in the South Parachute field would continue to be the subject of operations and maintenance activities into the foreseeable future.

ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

Based on onsite examinations, several elements of the original proposal presented by EnCana were altered or eliminated to minimize or mitigate resource impacts. Because these elements are either no longer part of the proposed action or have been substantially changed from the original proposal, they will not be analyzed in detail.

- PM19 Access Road Change – During preparation of GAP, EnCana made decision to relocate the access road serving the PM19 pad from BLM land onto adjacent private land. This would best serve landowners’ development plans on private land being submitted to Garfield County.
- PI19 Access Road and Pipeline – During onsite review, it was determined that the proposed road and pipeline location was traversing through an area of active slumping and ground movement. An alternate road and pipeline alignment was selected that avoided the active ground slumps and was better suited for visual resource mitigation.
- PN20 Pad – EnCana requested review of 2 APDs prior to completion of the SPGAP to gain additional geologic and engineering reservoir data for the South Parachute field. In fall 2006, BLM completed NEPA analysis and granted approval of the APDs with pad construction and drilling of the wells prior to onset of the big game winter timing limitation. Thus, for purposes of analysis in SPGAP, the PN20 pad is an existing pad supporting 2 directional wells.
- PH21 Pad – During onsite review of the proposed pad, it was apparent that active ground movement and slumping was prevalent in the vicinity of the pad. After field review of the site with a geotechnical consultant, it was determined that the best course of action was to avoid the site and the location was eliminated from further consideration.
- PJ21 Pad – This pad and associated access road was also proposed in an area of active ground movement and slumping. The results of an examination of the site with a geotechnical consultant indicated that this location should be avoided to obviate potential soil impacts. The pad was relocated to a more stable location and designated, PK21.
- PN24 Pad – After completion of the onsite review, the operator determined that the Section 24 portion of Federal lease COC27825 would not be developed at this time.
- PP24 Pad – After completion of the onsite review, the operator determined that the Section 24 portion of Federal lease COC27825 would not be developed at this time.
- PC28 Pad – EnCana requested review of 3 planned APDs on this private surface pad prior to completion of the SPGAP to gain additional geologic and engineering reservoir data for the South Parachute field. In May 2007, BLM completed NEPA analysis and granted approval of the APDs. Thus, for purposes of analysis in SPGAP, the PC28 pad is an existing pad supporting 1 Federal well at this time.
- PH28 Pipeline – During onsite review, the operator agreed to use a separate pipeline alignment running cross-country from PH28 pad to the existing PJ28 pad to allow for the placement of storage tanks. The storage tanks would reduce truck traffic to the PH28 pad.
- PH31 Pad – During onsite review, this pad was moved approximately 250 feet west-northwest to maximize opportunities to reduce earthwork and minimize overall surface disturbance. In addition, the access road and pipeline was moved slightly upslope to provide better transition and an improved curve radius to accommodate a planned gully crossing near the pad entrance. The pad was designated, PA31.
- PN31 Access Road and Pipeline – During onsite review, it was determined that the proposed road and pipeline serving the PN31 pad would create undesirable impacts to a dry gulch. An alternate, less impacting road and pipeline alignment was chosen.

LAND USE 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: Glenwood Springs Resource Management Plan (USDI 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. Record of Decision and Resource Management Plan Amendment, March 1999, page 15.

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 (USDI 1999a).

“Timing limitations will be used to avoid development activities during periods critical to many wildlife species” (USDI 1999a)

“BLM will develop appropriate Conditions of Approval (COAs) for all Application for Permit to Drill (APDs) for leases issued prior to the RMP amendment, provided the COAs are consistent with lease rights granted” (USDI 1999a).

“In areas being actively developed, the operator must submit a Geographic Area Proposal (GAP) that describes a minimum of two to three years activity for operator controlled leases within a reasonable geographic area” (USDI 1999a).

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

The proposed modification in the timing limitations stipulations are also in conformance with the 1999 RMP amendment. Although the modifications would shorten the timing limitation period on some leases, this protective restriction would be instituted as COAs on other leases where it is not currently in force.

The proposed action is structured as a multi-year development plan covering a large geographic area and, as such, is in conformance with decision to require operators to submit GAPs.

STANDARDS FOR PUBLIC LAND HEALTH

In January 1997, Colorado BLM approved the Standards for Public Land Health. The five standards cover upland soils, riparian systems, plant and animal communities, threatened and endangered species, and water quality. Standards describe conditions needed to sustain public land health and relate to all uses of the public lands. 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 was included in the Battlement Mesa LHA (USDI 2000). The analyses are presented below.

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 5). Only those mandatory critical elements that are present and affected are described in the following narrative. In addition to the mandatory critical elements, additional resources would be impacted by the proposed action and alternative. These are described in the section titled, **Other Affected Resources**.

Critical Environmental Elements

Air Quality

Affected Environment: The proposed action area (Garfield County) 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 amounts are determined to be below NAAQS standards. Although specific monitoring is not conducted in the SPGAP, existing air quality is generally good based on regional monitoring (USDI 2006). Air pollution emission sources are limited to a few industrial facilities, transportation emissions along the I-70 corridor, and residential emissions in the relatively small communities adjacent to the SPGAP.

Proposed Action:

The Roan Plateau RMPA and EIS describe potential effects from oil and gas development (USDI 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 (PM₁₀ and PM_{2.5}), sulfur dioxide, 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 effects 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. The mitigation measures presented in Appendix E (Number 2) would be implemented to minimize dust generation and vehicle emissions.

Table 5. Critical Elements of the Human Environment									
<i>Critical Element</i>	<i>Present</i>		<i>Affected</i>		<i>Critical Element</i>	<i>Present</i>		<i>Affected</i>	
	Yes	No	Yes	No		Yes	No	Yes	No
Air Quality	X		X		Prime or Unique Farmlands		X		X
ACECs		X		X	Special Status Species*	X		X	
Cultural Resources	X		X		Wastes, Hazardous or Solid	X		X	
Environmental Justice		X		X	Water Quality, Surface and Ground*	X		X	
Floodplains		X		X	Wetlands and Riparian Zones*	X		X	
Invasive Non-native Species	X		X		Wild and Scenic Rivers		X		X
Migratory Birds	X		X		Wilderness and WSAs		X		X
Native American Religious Concerns	X			X					

* Public Land Health Standard

No Action Alternative:

Environmental Consequences: Under the no action alternative, there would be no increase over current levels in vehicle and equipment emissions or fugitive dust generation.

Cultural Resources

Affected Environment: Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies to take in to account the effects their actions will have on cultural resources. Cultural resources may include archaeological or historical sites and traditional cultural concerns. As a general policy, an agency must consider effects to cultural resources for any undertaking that involves federal funding, federal permitting or authorization, or Federal lands. Because of this, consideration of the environmental consequences of the proposed action extends to all proposed actions within the SPGAP, whether the surface ownership is Federal or private.

Forty-two Class III cultural resource inventories have been conducted within the SPGAP area. Table 6 lists these inventories by Glenwood Springs Field Office (GSFO) reference number.

Table 6. Cultural Resource Inventories Conducted within the SPGAP*.					
584	1100-1	5498-6	5401-6	5406-8	14606-2
591	1105-3	5498-20	5402-22	5406-15	14606-3
641	1105-6	5498-21	5402-25	5407-14	
791	1105-10	5498-22	5403-14	5407-14A	
809	1105-17	5498-23	5404-18	15403-1	
886	1106-11	5498-24	5405-13	14505-1	
902	1106-19	5499-13	5405-8	14606-1	
1098-20	1107-10	5401-3	5406-5	14506-10	

* Glenwood Springs Field Office Reference Numbers

The acreage investigated by Class III inventories is approximately 1839 acres, or 38% of the SPGAP study area. The majority of this acreage was inventoried on or after 1990 and is considered adequate by current standards.

The SPGAP study area includes 95 recorded cultural resources. Of these 15 (15.7%) are eligible or potentially eligible for inclusion on the National Register of Historic Places (NRHP) and considered “historic properties.” Twenty-nine (30.5%) are sites are considered not eligible and 52 (54.7%) are isolated finds (IF) which by definition are considered not eligible. Historic properties within the study area include: prehistoric open camps, prehistoric open lithic scatters, aboriginal wooden structures, stone ring structure, and three historic era sites.

Proposed Action

Environmental Consequences: Oil and gas development activities have the potential to directly, indirectly, and/or cumulatively affect cultural resources. Direct impacts to archaeological sites result primarily from disturbance of surface and subsurface sediments containing buried cultural components. Direct impacts to protohistoric or historic era sites with structural remains result in damage to or destruction of these structures. These types of impacts are generally concentrated in the development phase of the proposed action, though they can happen any time the ground is subject to alteration.

Specific to the SPGAP area, two “historic properties” could be directly impacted by construction of one well location, access road, and pipeline. This potential effect required formal consultation with the Colorado State Historic Preservation Officer under the Colorado Protocol (1998) of the National BLM/State Historic Preservation Office (SHPO) Programmatic Agreement (1997). Formal consultation was initiated on April 17, 2007 on a plan to mitigate these potential impacts. The SHPO disagreed with the BLM’s mitigation in a letter dated April 30, 2007. Therefore, new mitigation was developed that requires EnCana to conduct extensive testing and/or possible data recovery prior to any work on this well pad, access road, or pipeline (Appendix F).

Eighty-one cultural resources that are not considered eligible for listing on the NRHP are located within or adjacent to areas proposed for pads, access roads, and pipelines. These resources could be directly impacted by the development activities. However, mitigation measures, such as avoidance, are not required for these resources because recording is deemed to have extracted their inherent intellectual information.

The proximity of developments to cultural resources may also lead to indirect impacts by changing the environmental setting, location, association, and feeling of the resource. This is especially true for sensitive Native American sites and/or areas of concern where developments can change the significance and meaning of these resources to Native Americans. Although Native American groups did not respond to requests for comment on the plan, three resources of potential concern were identified during the inventories. In order to minimize any potential impacts to the integrity of setting, location, association and feeling of these resources, they were avoided with a buffer during the design of the proposed developments.

Other indirect impacts stemming from oil and gas development are associated with increased public access and the presence of project personnel. These could include degradation of the condition and integrity of sites due to the increased surface collection and increased casual travel (which may physically impact sites).

All of the cultural resources identified in the SPGAP area, and those yet undiscovered, are susceptible to these types of indirect impacts. The most vulnerable resources would be those closest to the proposed developments in the project area. These impacts may not be quantifiable at the level of individual sites, but their accumulation over time and space could result in a substantial degradation of cultural resource values. Mitigation designed to minimize these impacts are included as COAs on the individual APDs (Appendix E, Numbers 3 and 4).

The remainder of the proposed SPGAP actions will not affect historic properties and formal consultation with the SHPO was not necessary. As long as the mitigation is strictly adhered to, the BLM can make a determination of “**No Historic Properties Affected**” for the SPGAP in accordance with the Section 106 of the National Historic Preservation Act, as amended (16 U.S.C. 470f), the BLM/SHPO Programmatic Agreement (1997) and Colorado Protocol (1998).
No Action Alternative

Environmental Consequences: Under this alternative, none of the proposed developments described in the SPGAP would take place. Therefore, there would be no direct impacts to cultural resources and the testing and/or data recovery plan would not be required. There would also be less potential for indirect impacts related to alterations in the integrity of setting, location, association and feeling of cultural resources in the area. Because access to the area would not be increased and project personnel would not be in the area, the potential for impacts related to illegal surface collection and casual travel would be reduced.

The Education/Discovery COA would remain in effect for existing operations in the SPGAP as the Inadvertent Discovery clause of the NHPA as would the Colorado Statutes CRS 24-80-1301 for Historic, Prehistoric, and Archaeological Resources, and for Unmarked Human Graves on private property.

Invasive Non-native Species

Affected Environment: Proposed access roads and well pads were surveyed for invasive species in the summer of 2005. During the surveys, numerous noxious and invasive weeds species were identified. These included four List B species: musk thistle (*Carduus nutans*), diffuse knapweed (*Centaurea diffusa*), Canada thistle (*Cirsium arvense*) and salt cedar (*Tamarix ramosissima*), and three List C species: cheatgrass (*Bromus tectorum*), field bindweed (*Convolvulus arvensis*), and common mullein (*Verbascum thapsus*) (Colorado Department of Agriculture 2007). Additionally, numerous other invasive weeds not listed in Colorado as noxious weeds were found in the area, including Siberian elm (*Ulmus pumila*), Russian-thistle (*Salsola iberica*), prickly lettuce (*Lactuca serriola*), crested wheatgrass (*Agropyron cristatum*), annual sunflower (*Helianthus annuus*), yellow sweet-clover (*Melilotus officinalis*), and various mustard species.

Nearly all of the existing and proposed access roads and well pads were infested to some degree with cheatgrass. Cheatgrass was particularly dominant in areas with evidence of previous disturbance, including areas burned by wildfire and the banks of existing roads.

Proposed Action:

Environmental Consequences: Surface-disturbing activities create conditions favorable for the invasion and establishment of noxious weeds and other invasive non-native species, particularly when these species are already present in the surrounding area. Since cheatgrass and other noxious and invasive weeds are present within the SPGAP area, the potential for weed invasion

following construction is high. Mitigation measures designed to minimize the spread of invasive, non-native species are presented in Appendix E (Number 5).

The salt cedar (Tamarisk) treatment element of the proposed action would result in the elimination of the species over a 250 acre area and would discourage their future spread.

No Action Alternative:

Environmental Consequences: Because there would be no new surface disturbance, the no action alternative would have little potential to promote new infestations of noxious weeds. However, current infestations would continue to spread if they are not treated. The salt cedar (Tamarisk) treatment element of the proposed action would not be implemented and their numbers would not be reduced over the 250 acre area. The lack of this reduction could encourage their spread.

Migratory Birds

Affected Environment: The SPGAP project area consists primarily of pinyon-juniper woodlands, sagebrush shrublands, mountain shrublands, and wetland and riparian vegetation that provide habitat and/or potential habitat for numerous migratory birds, including species identified as “birds of conservation concern” by the USFWS, Region 6 (Table 7, USFWS 2002).

Table 7. Birds of Conservation Concern Potentially Present in the SPGAP.		
<i>Common Name</i>	<i>Scientific Name</i>	<i>Habitat</i>
Northern Harrier	<i>Circus cyaneus</i>	Wetlands with dense vegetation; also grasslands, agricultural lands, mountain sagebrush, and marshes.
Ferruginous Hawk	<i>Buteo regalis</i>	Grasslands and semi-desert shrubs; rock outcrops, buttes.
Golden Eagle	<i>Aquila chrysaetos</i>	Open habitats including grasslands, sagebrush, farmlands, and pinyon-juniper woodlands.
Lewis’s Woodpecker	<i>Melanerpes lewis</i>	Open pine forest, riparian, and pinyon-juniper woodlands
Gray Vireo	<i>Vireo vicinior</i>	Pinyon-juniper woodlands; understory of sagebrush and other desert scrub.
Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>	Pinyon-juniper woodlands.
Virginia’s Warbler	<i>Vermivora virginiae</i>	Dense shrublands and scrub forest associated with mesa slopes, foothills, open ravines, and valleys.
Black-throated Gray Warbler	<i>Dendroica nigrescens</i>	Pinyon-juniper woodlands.
Sage Sparrow	<i>Amphispiza belli</i>	Large, low-elevation stands of big sagebrush or mixed big sagebrush and greasewood.

A raptor habitat survey was conducted in July, 2005 to provide preliminary information for onsite inspections (Greystone 2006). As part of the survey, nesting habitat within 0.25 mile of some of the access roads, pipeline ROWs, and well pads proposed at that time was examined for the presence of active and inactive raptor nests. The survey was conducted outside the recommended nesting survey period at the request of the operator. The areas around most proposed developments have not been inventoried for raptors and would therefore require surveys prior to ground-disturbing activities.

The 2005 survey located an active Cooper's hawk nest in Section 36 and an active red-tailed hawk nest in Section 21. The Cooper's hawk nest is not located within 0.25 mile of any proposed activity. The red-tailed hawk nest is located approximately 0.10 mile from the proposed PK21 pad and about 0.15 mile from proposed PK21 access road. Although active in 2005, the current status of the nest is unknown. There is no raptor timing limitation stipulation associated with the Federal lease (i.e., COC01523) where the pad and road would be located.

Proposed Action

Environmental Consequences: The proposed action would result in the direct loss of approximately 107 acres of foraging and nesting habitat for migratory bird species. The loss would result in an increase in habitat fragmentation and a reduction in habitat connectivity and habitat patch size. These alterations can be detrimental to migratory birds that require large intact habitat blocks and could ultimately lead to their displacement by species that prefer openings or forest edges. This could contribute to changes in natural species composition and abundance in the area. In addition, the removal of vegetation between April 1st and August 15th could result in the direct "take" (i.e., destruction) of active nests.

The excavation of reserve pits associated with development activities may be expected to attract waterfowl and other migratory birds for purposes of resting, foraging, or as a source of free water. Effects to birds contacting this water could vary by species and range from no discernible effect to mortality. As such, 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) (Appendix E, Number 6).

Construction activity would likely result in the displacement of birds to adjacent habitats due to noise and human presence. Indirect take (e.g., failure due to abandonment of one or both adults) of nearby nests can also occur as a result of intolerance to disturbance, although reactions vary between bird species. Reactions can range from subtle body changes undetectable to human observers to aggressive defense behavior. Some birds may fly away from the nest, appearing undisturbed, leaving nestlings vulnerable to overheating, chilling, predation, or starvation.

Disturbance to nesting birds, and hence the potential for direct and indirect take, would be reduced by adherence to timing limitation stipulations attached to Federal leases COC27823, COC27825, and COC27826. The stipulations prohibit exploration, drilling and development activity within 0.25 mile of active raptor nests during the April 1st to August 31st period. In order to provide more or less uniform protection for raptors across the project area, all developments proposed in areas not subject to the timing limitation stipulation would be subject to a Condition of Approval (COA) that would require new or updated raptor surveys.

Surveys would be required prior to the commencement of any new development activities. All potential nesting habitat within 0.25 mile of these developments would be surveyed. If an active raptor nest is located within 0.25 mile of the proposed activity, a 60-day timing limitation during the critical nesting period and/or relocation of individual developments by up to 200 meters may be required (Appendix E, Number 6).

The tamarisk treatment element of the proposed action, although modest in scope, would contribute to increasing habitat diversity in the riparian areas along the Colorado River. Increasing diversity would have direct benefits to species such as the Lewis's woodpecker and the

northern harrier which depend on riparian habitat for nesting and brooding. Other species such as the golden eagle and ferruginous hawk may benefit from an improved quality of foraging habitat.

No Action Alternative:

Environmental Consequences: Under the no action alternative, no additional surface disturbance would occur resulting in minimal new habitat fragmentation or direct habitat loss. Existing producing wells would continue to operate in the South Parachute field. The greatest increase in disturbance to migratory birds would be related to noise during currently approved well development or recompletions. This would be a localized, short-term event that is not expected to have a negative impact on the breeding population.

The tamarisk treatment would not be implemented under this alternative and a limited increase in habitat diversity along the Colorado River would not occur.

Native American Religious Concerns

Affected Environment: The SPGAP is within a larger area identified by the Ute Tribes as part of their ancestral homeland. Cultural resource inventories (see **Cultural Resources**) were conducted to determine if there were any areas that might be culturally sensitive to Native Americans. At present there are at least three areas of potential Native American concern identified by the GSFO within the SPGAP.

The Southern Ute, Ute Mountain Ute, and the Uintah and Ouray Bands of the Ute Tribe, were notified of the SPGAP, the cultural resource inventory results, and asked to respond if they had any questions or specific concerns no later than January 25, 2007. No responses were received. An additional letter was sent on April 18, 2007 about the proposed mitigation plan for one well location, access road, and pipeline. Again no responses, questions, or requests for additional information were received by May 31, 2007. If new data are disclosed at a later date by the Ute Tribes, new terms and conditions may have to be negotiated to accommodate their concerns

Proposed Action

Environmental Consequences: Direct impacts of construction of well locations, access roads, and pipelines have the potential to irreparably damage or destroy culturally sensitive sites. These impacts may affect the physical setting, possibly resulting in a loss of what makes the area significant. Indirect impacts from increased access and use by project personnel could range from illegal collection to vandalism, adversely impacting any sensitive site present. Cumulative impacts of increasing development, access, construction, operations and maintenance may also adversely impact these sites, possibly degrading the cultural significance by either destroying or altering the sensitive area or its landscape setting or feeling.

Although Native American groups did not respond to requests for comment on the plan, three resources of potential concern were identified during the inventories. In order to minimize any potential impacts to the integrity of setting, location, association and feeling of these resources, they were avoided with a buffer during the design of the proposed developments. Mitigation measures designed to protect resources of Native American concern are presented in Appendix E, (Numbers 3 and 4).

No Action Alternative

Environmental Consequences: Under this alternative, none of the proposed developments described in the SPGAP would take place. Therefore, there would be no direct impacts to Native American values. There would also be less potential for indirect impacts related to alterations in the integrity of setting, location, association and feeling of cultural resources in the area. Because access to the area would not be increased and project personnel would not be in the area, the potential for impacts related to illegal surface collection and casual travel would be reduced.

The Education/Discovery COA would remain in effect for existing operations in the SPGAP as the Inadvertent Discovery clause of the NHPA as would the Colorado Statutes CRS 24-80-1301 for Historic, Prehistoric, and Archaeological Resources, and for Unmarked Human Graves on private property.

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

Affected Environment:

The U. S. Fish and Wildlife Service list of threatened, endangered, proposed or candidate species for Garfield County (<http://mountain-prairie.fws.gov/endspp/CountyLists/COLORADO.htm>) identifies the following plant and animal species which may occur within the project area or be impacted by the proposed action: Uinta Basin hookless cactus (*Sclerocactus glaucus*), Parachute beardtongue (*Penstemon debilis*), DeBeque phacelia (*Phacelia submutica*), Canada lynx (*Lynx canadensis*), Mexican spotted owl (*Strix occidentalis*), yellow-billed cuckoo (*Coccyzus americanus*), razorback sucker (*Xyrauchen texanus*), Colorado pikeminnow (*Ptychocheilus lucius*), bonytail chub (*Gila elegans*), and humpback chub (*Gila cypha*). The Colorado River and its 100-year floodplain, which lie in proximity to the proposed activity, are designated Critical Habitat for the razorback sucker and Colorado pikeminnow.

BLM sensitive plant and animal species with habitat and/or occurrence records in the area include adobe thistle (*Cirsium perplexans*), DeBeque milkvetch (*Astragalus debequaeus*), Naturita milkvetch (*Astragalus naturitensis*), Roan Cliffs blazing star (*Mentzelia rhizomata*), Piceance bladderpod (*Lesquerella parviflora*), Harrington's penstemon (*Penstemon harringtonii*), bald eagle (*Haliaeetus leucocephalus*), milk snake (*Lampropeltis triangulum taylori*), midget faded rattlesnake (*Crotalus viridis concolor*), Great Basin spadefoot (*Spea intermontana*), roundtail chub (*Gila robusta*), bluehead sucker (*Catostomus discobolus*), and flannelmouth sucker (*Catostomus latipinnis*).

Bald Eagle – Bald eagles nest along the Colorado River in western Colorado at low densities. In 2007, there were 3 active nests between New Castle and DeBeque. The number of wintering bald eagles in this area depends on a variety of factors and varies between years. The 10-year average for wintering birds within this portion of the Colorado River is 45.5 birds or approximately 0.46 bald eagles per mile (Graham 2006). These numbers are based on relatively stable mid-winter counts conducted by the CDOW between the town of Silt, Garfield County, and the Utah state line (Graham 2006).

Although bald eagles have been observed in the area, there are no known bald eagle nests or roost sites within the boundary of the SPGAP. The nearest bald eagle nest is located approximately 10 miles northwest near Rifle (CDOW 2005). Bald eagle winter habitat and a winter roost site are

located approximately 0.5 mile from proposed well pad PM19. The proposed access road to pad PM19 is also within bald eagle winter habitat (Appendix A, Figure 5).

Milk Snake – The milk snake occurs in a wide variety of habitats in Colorado, including shortgrass prairie, sand prairie, shrubby hillsides, canyons, open stands of ponderosa pine, pinyon-juniper woodland, and arid river valleys. Although no occurrence records for this species exist near the project area, suitable habitat is present (CNHP 2005).

Midget Faded Rattlesnake – The midget faded rattlesnake is a small, pale-colored subspecies of the common and widespread western rattlesnake. The midget faded rattlesnake is endemic to a small area of southwestern Wyoming, northwestern Colorado, and adjacent Utah, including western Garfield County. Suitable habitats include sandy and rocky areas in pinyon-juniper and semi-desert shrub.

Great Basin Spadefoot – This species is found in rocky canyons, broad dry basins, and stream floodplains scattered throughout northwestern Colorado. It is inactive most of the year, emerging from the substrate of seasonal ponds or ephemeral streams to breed and feed during periods of protracted surface moisture.

Roundtail Chub – The roundtail chub is found in the Colorado River mainstem and large tributaries (Woodling 1985). Adults inhabit slow-moving water near areas of faster water and swim into the faster water in small groups to forage. Young-of-the-year prefer shallow river runs, while juveniles concentrate in eddies.

Bluehead Sucker – This species is found throughout the middle and upper Colorado River Basin, in a variety of areas from headwater streams to large rivers (Woodling 1985). The bluehead sucker prefers areas with a rock substrate and mid to fast flowing waters.

Flannelmouth Sucker – The flannelmouth sucker is restricted to larger streams and rivers in the middle and upper Colorado River Basin. In Colorado, this species is found only in large rivers, where it occupies in all habitat types, including riffles, runs, eddies, and backwaters (Woodling 1985).

Proposed Action:

Environmental Consequences:

Federally Listed, Proposed, or Candidate Plant Species

Although suitable habitat for the Uinta Basin hookless cactus this species may be present within the SPGAP project area, the plant has not been found this far to the east (Scheck 2006). Therefore, the proposed action would have “**No Effect**” on the Uinta Basin hookless cactus.

Suitable habitat for the DeBeque phacelia and Parachute beardtongue is unlikely to be present within the SPGAP area (Scheck 2006). Therefore, the Proposed Action would have “**No Effect**” on these species

Federally Listed, Proposed, or Candidate Animal Species

Canada Lynx – Because the well pads and associated roads with the potential to affect lynx are at least 400 meters (0.25 mile) from the nearest winter foraging or denning habitat, no effects on the

ability of lynx to den or forage in nearby appropriate habitats are expected to occur (Appendix A, Figure 4). A proposed access road in lynx “other” habitat is estimated to alter approximately 2.1 acres based on 0.35 miles of road with a 50-foot width of disturbance. The road occurs on a southwest facing slope where Gambel oak is the dominant vegetation type. Based onsite conditions, a dry Gambel oak community is expected to occur at the site rather than the wet Gambel oak type described in the definition of “other” lynx habitat. Therefore, vegetation affected by the proposed access road is not considered lynx “other” habitat. As such, the effects analysis for lynx will focus on potential impacts from noise and human activity associated with drilling and production of natural gas.

Existing well pads PL-28 and its associated infrastructure is located 225 meters (738 feet) from mapped lynx “other” habitat type and is outside the LAU. Existing well pad PJ-28 lies within lynx “other” habitat but will not alter any additional habitat under the proposed action. Proposed pad PH-28 is located outside the LAU and will not directly alter lynx habitat. Noise could influence the use of these areas by prey species, potentially limiting this area for use during summer months for foraging. However, because the aspect and habitat type at this location is similar to that of the nearby proposed access road, it is doubtful that prey species would occur in such a xeric environment. More suitable habitat is available to the east, south and southwest.

New roads have the potential for improved access to lynx habitat by competitors and predators as a result of snow compaction on roadways (Buskirk et al. 1999, Hickenbottom et al. 1999, Stinson 2000, USFS 2000). New snow compaction will occur along 0.35 miles of proposed road where the road crosses through a portion of the LAU to access proposed pad PH-28. However, given that the dry oak vegetation type found at this location is not considered lynx habitat, new snow compaction at this location would not affect lynx.

A determination of "**May Affect, Not Likely to Adversely Affect**" was made for lynx. The U.S. Fish and Wildlife Service concurred with this finding following informal consultation.

Mexican Spotted Owl – In Colorado, the Mexican Spotted Owl (MSO) occurs in lower elevation forests, mostly in deeply incised, rocky canyons that contain complex forest structures of uneven-aged, multi-level, and old, dense stands. Prey includes rodents such as mice, voles, and woodrats, but the species also feeds on bats, birds, snakes, and lizards.

Although canyons are present within the SGAP area, the steep, incised, rocky canyons that the MSO prefers are not present. The project area is not located within any designated critical habitat unit for the MSO and there are no known breeding populations located in the area. Therefore, the proposed action would have “**No Effect**” on this species or its habitat.

Yellow-billed Cuckoo – In the West, yellow-billed cuckoos breed in large blocks of riparian habitat, usually greater than 25 acres (Federal Register Vol. 66, No 143, p. 38611-38626, July 2001). Such habitat is not present in the SGAP project area. Although Dry Creek has a dense, productive community of narrowleaf cottonwood, it is restricted to narrow linear segments of insufficient size to function as nesting habitat. There are no records of this species in the vicinity of the SPGAP project area (CNHP 2005). Therefore, the proposed action will have “**No Effect**” on this species or its habitat.

Colorado River Endangered Fishes – Construction of the proposed developments 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, these federally listed fishes are adapted

to naturally high sediment loads. The mitigation measures presented in Appendix E (Numbers 7-9) would reduce the potential. With the implementation of these measures, the proposed action would have “**No Effect**” on the razorback sucker, Colorado pikeminnow, bonytail chub, or humpback chub.

BLM Sensitive Plant Species

Two BLM sensitive plant species, the Harrington Penstemon and the Rocky Mountain thistle (*Cirsium perplexans*), could occur in the SPGAP area. Although suitable habitat exists, the BLM conducted surveys for this plant in 2000 and found no occurrences within the SPGAP area (Scheck 2006). However, it was found several miles to the east on basalt exposures along Porcupine Creek and within Spruce Gulch (Scheck 2006).

The Rocky Mountain thistle has been found in nineteen locations in four counties in Colorado (Delta, Mesa, Montrose, and Ouray Counties). This plant is found almost exclusively on clay soils or "adobe hills" that are derived from shales of the Mancos Shale or the Wasatch Formation. Although suitable habitat for this species may be present within the SPGAP area, no occurrences have been recorded this far to the east (USDI 2000, Scheck 2006).

BLM Sensitive Animal Species

Bald Eagle – Because potential nesting habitat within and near the project area is currently unoccupied, no effects to nesting bald eagles would occur as a result of project implementation. In addition, project activities would not occur within cottonwood riparian habitats and would not directly affect potential nest trees. Therefore, the effects analysis will focus on disturbance related impacts associated with increased noise and human presence in bald eagle wintering habitat.

Determining the impacts of noise on roosting bald eagles is difficult due to the individual variation in tolerances to activities demonstrated by bald eagles during specific periods of their life cycle. The degree of disturbance is dependent upon the proximity, frequency, timing, magnitude and duration of noise or human activity in the area (USFWS 1998).

Implementation of the proposed action would result in increased noise levels particularly during road and well pad construction, well drilling, and completion. Noise impacts from drilling and completion activities would last approximately 45 to 60 days for 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 152 meters (m), actions associated with drilling and completion would generate approximately 55 dB(A) at 304 m. This level of noise approximates that associated with light industrial activities (EPA 1974).

Noise impacts would decrease during the production phase. Pumping units and compressor noise levels would be approximately 50 dB(A) at 99 to 114 m (325 - 375 feet) and continued small truck traffic would generate somewhat less. These levels would be less than the construction phase, but greater than background noise levels. During maintenance and workovers, noise would increase above noise levels associated with routine well production.

The CDOW has mapped approximately 15 alternate roost locations between the project area and the town of Parachute. Additionally, there are five CDOW mapped roosts sites and likely others that are not currently mapped between the towns of DeBeque and Palisade to the west of the project area. Interpretation of aerial images (2006) indicates that the majority of these roost locations have not been impacted by energy development and are available as roost sites.

Milk Snake, Midget Faded Rattlesnake, and Great Basin Spadefoot – Direct effects on these species could include injury or mortality as a result of construction, 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 for the two snake species could include a greater susceptibility to predation if the road or pad is used for temperature regulation. The potential for injury or mortality as a result of vehicles traveling on new roads and pads would increase for individuals of all three species. However, the overall potential for effects is low and impacts at the population level are not expected.

Flannelmouth Sucker, Bluehead Sucker, and Roundtail Chub – Mitigation measures presented in Appendix E (Numbers 7-9) would be implemented to minimize sedimentation of the Colorado River and tributary streams. Although minor temporary increases may occur, they are unlikely to be detectable above background levels. For this reason, and because the flannelmouth sucker, bluehead sucker, and roundtail chub are adapted to high sediment loads, the proposed action would not be expected to adversely affect these species.

Analysis on the Public Land Health Standard for Threatened, Endangered, and Sensitive Species: The Land Health Assessment of the Battlement Mesa Area (USDI 2000), which included the SPGAP project area, determined that Standard 4 was being achieved for those threatened, endangered, and special status species for which there is appropriate habitat. With the implementation of the mitigation measures identified in this section and elsewhere in this EA, Standard 4 should continue to be achieved.

The no action alternative would have no bearing on Standard 4 because the developments described in the proposed action would not occur.

Wastes, Hazardous or Solid

Affected Environment: Hazardous materials are defined by the BLM as any substance, pollutant, or contaminant that is listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, 42 USC 9601 et seq., and its regulations. The definition of hazardous substances under CERCLA includes any “hazardous waste” as defined in the Resource Conservation and Recovery Act (RCRA) of 1976, as amended, 42 USC 9601 et seq., and its regulations. The term does not include petroleum, including crude oil or any fraction thereof that is not otherwise specifically listed or designated as a hazardous substance under CERCLA Section 101(14), 42 USC 9601 (14), nor does the term include natural gas.

The Environmental Protection Agency (EPA) has exempted certain waste materials generated in oil and natural gas exploration and production from regulation as hazardous wastes (USEPA 2002). To classify as exempt waste, these materials must be intrinsic or uniquely associated with the production of oil and natural gas. Examples of these exempt wastes include produced water, drilling fluids, and drill cuttings. Although specifically exempted from regulation as hazardous wastes, these materials are considered to be solid wastes and must be disposed in ways that protect human health and the environment.

A variety of materials typical of oil and gas development could be onsite during construction and operations including: lubricants, diesel fuel, gasoline, solvents, and hydraulic fluids. Drilling and completion operations would require the use of drilling muds and would produce substantial

quantities of produced water and condensate. Other solid wastes associated with the proposed development would include human waste and trash.

Proposed Action:

Environmental Consequences: Potential impacts from hazardous materials on the SPGAP project area include potential discharges of waste streams (e.g., drilling muds, produced water, and gas condensate) to local water resources and soils. Drilling muds are typically water based but may contain small concentrations of a variety of contaminants, including mercury, cadmium, arsenic, and hydrocarbons, which could adversely effect soil and water resources.

Produced water is typically high in salinity and may contain other contaminants. Potential releases of produced water could occur from wellheads, tanking, piping, reserve pits, and transport trucks. This could be the result of an accident, tank or piping failure, or pit breach. In addition, releases during the high-pressure fracing period due to poor well completion are also possible.

Gas condensate, which resembles light crude oil, is composed of hydrocarbons in a liquid state. Releases of condensate, which could result from wellhead, pipeline, or tank integrity failures, could contaminate soil and water resources, potentially rendering them toxic.

Conditions of Approval (COAs) that would mitigate impacts related to wastes are presented in (Appendix E, Number 10). With the implementation of these mitigation measures, impacts to human health and natural resources from the accidental release of solid or hazardous wastes is considered remote.

No Action Alternative:

Environmental Consequences: Under the no action alternative, there would be no new impacts associated with wastes. However, impacts associated with existing developments in the SPGAP area would be similar to the proposed action.

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

Surface Water

The SPGAP area encompasses four subwatersheds within the Colorado Headwaters Plateau watershed: Pete and Bill Creek, Dry Creek, Monument Gulch, and a small portion of Battlement Creek (Appendix A, Figure 6). Water courses that intersect the SPGAP area are limited to three intermittent streams: Pete and Bill Creek, Dry Creek, and Monument Gulch. All of these streams are tributary to the Colorado River. There are no perennial streams in the SPGAP area.

These streams are naturally ephemeral to intermittent, flowing seasonally or for very short periods in response to convective storms. Peak flows typically occur in early spring and summer in response to peak snowmelt. However, summer convective storms can cause flood flows in these drainages. The flow in Pete and Bill Creek is augmented by an irrigation diversion from Dry Creek, which has altered the natural hydrologic characteristics of both creeks. At the present time, streamflow data are not available for these streams.

The Colorado Department of Public Health and Environment, Water Quality Control Commission (CDPHE, WQCC) has designated beneficial uses for the streams in the SPGAP area as Aquatic Life Warm 2, Recreation 1b, and Agriculture. Narrative standards for the applicable beneficial uses are as follows:

- Aquatic Life Warm – Class 2: These are waters that are not capable of sustaining a wide variety of warm water biota, including sensitive species, due to physical habitat, water flows or levels, or uncorrectable water quality conditions that result in substantial impairment of the abundance and diversity of species.
- Recreation - Class 1b: These are waters for which primary contact uses have the potential to occur and for which no use attainability analysis has been performed. Recreation class 2 waters are not suitable or intended to become suitable for primary contact recreation.
- Agriculture: These surface waters are suitable or intended to become suitable for irrigation of crops usually grown in Colorado and which are not hazardous as drinking water for livestock.

The Clean Water Act (CWA) requires states to compile a list of water bodies, known as the 303(d) list, that do not fully support their beneficial uses. No streams in the SPGAP area are on the 2004 State of Colorado's 303(d) list of water-quality-limited segments.

Waters of the U.S.

Section 404 of the Clean Water Act requires a Department of the Army permit from the US Army Corps of Engineers (USACE) prior to discharging dredged or fill material into waters of the United States as defined by 33 CFR Part 328. A USACE permit is required for both permanent and temporary discharges into waters of the United States. Due to the flashy nature of area drainages and anticipated culvert maintenance, the USACE recommends designing drainage crossings for the 100-year event. Drainage crossings within the project area would be required to pass a 25-year or greater storm event in accordance with *Surface Operating Standards for Oil and Gas Exploration & Development* (USDI and USDA 2006). The 25-year, 6-hour precipitation event for the proposed action area is approximately 1.6 inches and the 25-year, 24-hour precipitation event is approximately 2.2 inches.

Detailed construction plans for the proposed access roads (and associated buried pipelines) would be prepared and submitted for review prior to construction. The road design would include specific drainage components and Best Management Practices (BMPs) that would be used to mitigate sedimentation of surface waters. The following is a list of drainage crossings that would be needed at certain proposed well pads:

- PB22 - Multiple culverts would be needed where the access road crosses several large washes.
- PH28 - One or more large culverts would be needed at the crossing of Dry Creek.
- PI19 - Multiple culverts would be needed where the access road crosses several drainages.
- PN31 - Multiple large culverts would be needed at the crossing of streams and drainages.

In 2005, Cordilleran Compliance Services on behalf of EnCana, submitted permit applications to request USACE verification of Nationwide Permit applicability for the drainage crossings within the project area. In 2006, the USACE responded in writing and indicated that these crossings would be authorized by Nationwide General (NWP) permit number 14.

Groundwater

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

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

No water wells have been developed within the SPGAP area, however nine wells are located within one mile, particularly in Sections 19 and 24 (CDWR 2005). The depths of the wells range from 19 to 160 feet. The use of the wells is primarily domestic; therefore it can be assumed that the quality of the water is fit for human consumption.

Proposed Action:

Environmental Consequences:

Surface Water

Potential effects to surface water include changes in the quantity of surface flows, changes in surface water quality and suitability for designated uses, erosion and degradation, and increased sedimentation. No changes in the quantity of surface flows is expected within the SPGAP area, as all water necessary for drilling and completion would be obtained from offsite sources. Therefore, there would be no adverse effects to stream flow regimes in the SPGAP area.

The proposed action could affect surface water quality. Various solid and liquid contaminants, including trash, produced water, drill cuttings, fuel, and lubricants for vehicles and heavy

equipment would be used during the construction and production phases of the project (see **Wastes, Hazardous or Solid**). There is potential for these waste materials to be directly spilled into a stream or migrate from an area of a spill into surface water. However, the potential for contamination of surface water from these events is expected to be minor with the implementation of mitigation measures (Appendix E, Number 10).

Increases in erosion and sedimentation could occur as a result of the implementation of the proposed action. Disturbance from construction of well pads could cause short-term increases in turbidity and an increase in the deposition of sediment in stream channels. However, no well pads would be constructed directly adjacent to streams, and reclamation procedures would help to minimize erosion and sedimentation.

The proposed access roads are likely to be a source of sediment. Roads intercept surface and subsurface flows and routes them more quickly to stream channels. In addition, roads have lower infiltration rates, generate greater runoff, and cause increased soil erosion from road surfaces, cuts, and fills. This can increase the sediment delivery to surface drainages, cause higher peak flows, and accelerate the timing of peak flows. This process is most prevalent where roads encroach on streams. Approximately 1.3 miles of proposed roads in the SPGAP project area would be within 100 feet of streams. To minimize potential impacts, the mitigation measures presented in Appendix E (Numbers 8 and 9) would be implemented to protect surface water.

Waters of the U.S.

Drainage crossings would require the use of fill material which could result in additional sediment being available for transport. Rip rap and reclamation practices would be used to stabilize road fills at crossings. Improperly designed drainage crossings, in particular undersized culverts and poorly aligned culverts, could result in channel degradation that may include excessive bank erosion at culvert outlets, ponding of flows, excess sedimentation at culvert inlets, and channel scour both at inlets and outlets. These potential impacts would be minimized with the use of BMPs and standards described in *Surface Operating Standards for Oil and Gas Exploration & Development* (USDI and USDA 2006).

Groundwater

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

The reserve pit used on each new well pad would be lined to ensure that drilling mud or produced water would not affect groundwater resources. The reserve pit would be constructed so as not to leak, break, or allow discharge. Specific mitigation measures for the protection of groundwater resources are presented in Appendix E (Number 8).

No Action Alternative:

Surface Water

Environmental Consequences: Under the no action alternative, no new impacts to surface water would occur. However, the types of potential impacts to surface waters from on-going natural gas well development would be generally similar to the proposed action.

Waters of the U.S.

Environmental Consequences: The no action alternative would involve no new construction and would have no additional effect on waters of the U.S.

Groundwater

Environmental Consequences: There would be no new effects from the implementation of the no action alternative. On-going natural gas development in the SPGAP area would be the primary source of impacts to groundwater sources. However, since the same protective measures are being implemented, impacts from the no action alternative would be similar to those of the proposed action.

Analysis on the Public Land Health Standard for Water Quality: Water quality data specific to the streams in the SPGAP project area are very limited. Two water quality samples were collected on Dry Creek in the early 1980s. Analysis of those samples indicated elevated levels of alkalinity, hardness over 390 mg/l as CaCO₃, and a mean pH of 8.1. While no water quality data are available for Monument Gulch and Pete and Bill Creek, the water quality is projected to be similar to Dry Creek, given similar geology, aspect, elevation, precipitation. No sediment data are available for these streams; however indications are that elevated sediment levels are common during runoff events (USDI 2000). Available water quality data do not suggest that the public land health standard for water quality is being compromised.

An assessment of the entire Colorado River Basin, which included the Colorado Plateau, was completed in 1998 by the United States Geological Survey (USGS) National Water Quality Assessment Program (NAWQA). The assessment found that pesticides were commonly detected in streams of the Colorado Plateau during the growing season; however, the concentrations were typically low. Pesticide concentrations that exceeded guidelines for the protection of aquatic life were detected in only 5 of 90 samples. The herbicides Atrazine and Alachlor were detected in more than one-half of the water samples collected; these compounds were also commonly detected in agricultural areas nationwide. Nutrient and suspended-sediment concentrations in streams in the Colorado Plateau were typically greater than concentrations found in streams in other areas of the Colorado River Basin. The Colorado Plateau also had elevated sediment concentrations. Any rain or snowmelt event in these areas tends to substantially increase the sediment concentrations of streams and rivers because of the high erodibility of the regional soils.

With the implementation of mitigation measures, the proposed action and no action alternative would not likely prevent the Public Land Health Standard for Water Quality from being met.

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

Affected Environment: Under Section 404 of the Clean Water Act (CWA), the term wetland is defined as “areas that are inundated or saturated by surface or groundwater at a frequency and

duration sufficient to support and that under normal conditions do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” One potential wetland was identified near a spring on private property in T7S, R95W, Section 28.

Riparian areas are types of wetlands that are transitional between permanently saturated wetlands and upland terrestrial areas. Riparian zones in the SPGAP project area occur along intermittent drainages and are generally in good condition (USDI 2000). Dry Creek contains a dense, productive community of narrowleaf cottonwood (*Populus angustifolia*), chokecherry (*Prunus virginiana*), skunkbrush sumac (*Rhus trilobata*), and red-osier dogwood (*Swida sericea*). The riparian vegetation along Dry Creek also includes mountain maple (*Acer glabrum*) and quaking aspen (*Populus tremuloides*). A road parallels the stream and crosses it in several locations, but does not appear to be a significant source of degradation to the riparian zone.

The flow in the North Fork of Pete and Bill Creek is being augmented by an irrigation diversion from Dry Creek. The stream system supports very little herbaceous vegetation. The woody riparian vegetation is patchy and consists of young and old cottonwoods and willows (*Salix* spp.) (USDI 2000). Monument Gulch is a small stream with a steep gradient. There is a narrow riparian zone immediately adjacent to the stream and the riparian zone appears to be widening. Young willows and skunkbrush sumac are growing along the banks and, where the gradient levels out, sedges (*Carex* spp.), and rushes (*Juncus* spp.) are establishing (USDI 2000). A Proper Functioning Condition (PFC) Assessment was completed in 2000; the results are summarized in Table 8 (USDI 2000).

<i>Stream/Drainage</i>	<i>Date Assessed</i>	<i>Miles Assessed</i>	<i>Condition (Functional Rating)¹</i>	<i>Trend²</i>
North Fork Pete and Bill Creek	05/04/00	0.7	FAR	Upward
Dry Creek	06/24/94	2.7	PFC	N/A
Dry Creek	04/27/00	2.7	PFC	N/A
Monument Gulch	06/24/94	1.0	NF	N/A
Monument Gulch	05/02/00	0.6	FAR	Upward
¹ PFC = Proper Functioning Condition, FAR = Functioning At Risk, NF = Nonfunctional.				
² Trend is only determined for those riparian areas classified as functioning at risk.				

Proposed Action:

Environmental Consequences: Riparian vegetation along Dry Creek would be removed for the proposed road crossing used to access the proposed PH28 wellpad. In addition, increased traffic on the existing access road along Dry Creek in Sections 28, 29, and 31 would contribute additional dust and sediment throughout the riparian corridor. These impacts to riparian vegetation would be minor given the condition of existing riparian vegetation, but there is potential for some fugitive dust and additional road runoff to reach Dry Creek especially in denuded areas such as drainage crossings. The mitigation measures presented in Appendix E (Numbers 2, 8 and 9) would be implemented to protect riparian vegetation and minimize potential negative impacts.

While the tamarisk treatment element of the proposed action would not benefit the riparian areas associated with Dry Creek, Pete and Bill Creek, or Monument Gulch, it would benefit a 250-acre area of riparian habitat along the Colorado River floodplain. The elimination on tamarisk would

arrest the invasion of the species in this area and contribute to a nominal improvement in the larger habitat's functioning condition.

No Action Alternative:

Environmental Consequences: The no action alternative would involve no new construction and would have no affect on floodplains, wetlands, or riparian zones.

Analysis on the Public Land Health Standard No. 2 for Riparian Systems. The riparian systems along Dry Creek, Monument Creek, and Pete and Bill Creek were all achieving the standard or moving toward achieving the standard in 2000 (USDI 2000). Although some of the systems were considered FAR or NF, they were considered to be making significant progress toward achieving the standard because they had improved considerably from indications observed during the 1994 PFC assessment. Other indicators of upward trend, such as diverse age-class, composition, high vigor, and riparian zone widening, were also noted.

The proposed action with associated mitigation, and the no action alternative, would not likely prevent the Public Land Health Standard for riparian systems from being met.

Other Affected Resources

In addition to the critical elements, the resources presented in Table 9 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 9. Other Resources Considered in the Analysis.			
<i>Resource</i>	<i>NA or Not Present</i>	<i>Present and Not Affected</i>	<i>Present and Affected</i>
Access and Transportation			X
Cadastral Survey	X		
Fire/Fuels Management		X	
Forest Management	X		
Geology and Minerals			X
Law Enforcement	X		
Paleontology		X	
Noise			X
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: Access to the SPGAP project area would be from I-70 (Exit 75) at Parachute. Gas field traffic generally accesses the area from the frontage road west of Parachute

and Garfield County Road (CR) 300 at the Una Bridge. After crossing the Colorado River at the Una Bridge, CR300, and CR304 provide the primary haul route to the High Mesa-Dry Creek areas of the project area. Spring Creek Road (CR306) provides access to the PH1 pad on the mesa overlooking Pete and Bill Creek. The other primary access to the Battlement Creek area of the project area is from Parachute to the Battlement Parkway (CR300A) to CR308 and east on CR302 to the proposed PB22 pad. These same county roads provide access to residences scattered throughout the area. The Garfield County Road and Bridge Department administers use of county roads for oil and gas development through the issuance of transportation permits, which include weight restrictions and preferred county road haul routes.

Proposed Action:

Environmental Consequences: Under the proposed action, substantial increases in the volume of both heavy and light traffic would occur.

Refer to Appendix E, Number 11 for mitigation measures applicable to transportation resources.

No Action Alternative:

Environmental Consequences: Field development traffic serving producing gas wells would continue at current levels in the SPGAP area. Some drilling and completion traffic would occur on High Mesa and in the Dry Creek area when private wells on private land are being drilled. No increases in traffic above these levels would occur under this alternative, because the new developments described under the proposed action would not occur.

Geology and Minerals

Affected Environment: The SPGAP area is located within the southern Piceance Basin. The Piceance Basin is a broad, asymmetric structural basin at the eastern edge of on the Colorado Plateau. The basin trends southeast to northwest and contains over 20,000 feet of Cambrian through Tertiary strata. It is flanked by the White River uplift in the northeast, and the Gunnison and Uncompahgre uplifts to the south and is separated from the Uinta Basin to the west by the Douglas Creek Arch.

Mineral resources within the basin include oil and gas deposits, coal, and sand and gravel. Oil and gas production is derived from tight sandstones in the Cretaceous Mesaverde Group and the Tertiary Wasatch Formation. Oil and gas are currently being produced from thousands of existing wells in nearby fields. There are several known hydrocarbon-producing marine sands located at the base of the Mesaverde Group, including the Cameo coal zone. Sand and gravel deposits are found in limited amounts in Quaternary alluvial deposits along stream valleys.

Proposed Action:

Environmental Consequences: 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 wells' economic lives. 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. Measures for the protection of geologic resources are detailed in Appendix E, (Number 12).

Additional effects could include an increased potential for landslides and fault movement. Small, active slumps and earthflows have been observed within the claystones of the Wasatch Formation and younger rocks near Battlement Mesa. New slumps may occur as a result of road and well pad construction on steep slopes in the Wasatch Formation. Use of drilling fluids under pressure and hydraulic fracturing of the wells could potentially induce movement in nearby faults, causing an earthquake. However, Colorado is considered a region of minor earthquake activity with a peak acceleration of 20 percent and a 2 percent probability of exceedance in 50 years (USGS 2007).

No Action Alternative:

Environmental Consequences: Under the no action alternative, no new impacts to geological and mineral resources would occur. However, the impacts from on-going developments in the SPGAP area have been or would be similar to those of the proposed action.

Noise

Affected Environment: Major sources of noise in the region are the town of Parachute, oil and gas activities, ranching operations, and roadways. Background noise surveys have not been conducted; however noise in rural areas away from industrial facilities and transportation corridors is generally 30 to 40 dBA.

Noise levels reported for various elements of oil and gas development are between 50 dB(A) for the operation of typical compressor station to approximately 68 dB(A) for truck traffic and crane operation (Table 10). These levels are a function of distance; the closer to the source, the greater the noise.

Table 10. Noise Levels Associated with Oil and Gas Production and Development.	
<i>Source</i>	<i>Reported Noise Level</i>
Typical compressor station	50 dB(A) (375 feet from property boundary)
Pumping units	50 dB(A) (325 feet from well pad)
Fuel and water trucks	68 dB(A) (500 feet from source)
Crane for hoisting rigs	68 dB(A) (500 feet from source)
Concrete pump used during drilling	62 dB(A) (500 feet from source)
Average well construction site	65 dB(A) (500 feet from source)
La Plata County (2002)	

Proposed Action:

Environmental Consequences: Implementation of the proposed action would result in increased noise levels particularly during road and well pad construction, well drilling, and completion. Short-term (7 to 14 day) increases in noise levels would characterize each site associated with road and well pad construction. Based on the Inverse Square Law of Noise Propagation (Harris 1991) and an average construction site noise level of 65 dB(A) at 500 feet, construction noise would equal approximately 59 dB(A) at 1,000 feet. At 1,000 feet, noise levels would approximately those of an active commercial area (USEPA 1974).

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 55 dB(A) at 1,000 feet. This level of noise approximates that associated with light industrial activities (USEPA 1974).

Traffic noise levels would also be elevated as a consequence of the proposed action. The greatest increase would be along County and BLM access roads during the drilling and completion phases. Based on the La Plata County data presented in Table 8, 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. Pumping units and compressor noise levels would be approximately 50 dB(A) at 325 to 375 feet and continued small truck traffic would generate somewhat less. These levels would be less than those occurring during the construction phase, but greater than background noise levels. During maintenance and workovers, noise would increase above levels associated with routine well production.

Refer to Appendix E, (Number 13) for mitigation measures related to noise impacts.

No Action Alternative:

Environmental Consequences: Under the no action alternative, noise levels would no increase over those presently associated with on-going oil and gas development activities.

Paleontology

Affected Environment: Scientifically important vertebrate fossils are known to occur in the Wasatch Formation within SPGAP project area. The Paleocene-Eocene Wasatch Formation includes mammals, birds, reptiles, fish, fresh water clams and snails, and plants. Important invertebrate fossils are known from the Parachute Creek member of the Green River Formation. The Eocene Green River Formation includes fossil insects (over 100 species), as well as plants, gar and other fish, turtles and crocodilians.

Proposed Action:

Environmental Consequences: The construction of oil and gas facilities, including access roads and well pads, could adversely affect scientifically important fossils. Both surface and subsurface

fossils could be damaged or destroyed. The greatest potential for impacts is associated with excavations of surface sediments and shallow bedrock.

The results of a review of USGS geologic map and topographic quadrangles and aerial photos indicate that the project area is heavily vegetated and covered with thick soil deposits. In addition, an examination of the BLM paleontology database and consultation with the BLM Regional Paleontologist indicate that there are no known fossil deposits in the SPGAP area. It is unlikely that a field survey would provide additional information unless outcrops free of soil and vegetation could be identified. However, in the event that paleontological resources are encountered, a standard paleontological condition of approval would be attached to the APDs. (Appendix E, Number 14).

No Action Alternative:

Environmental Consequences: Under the no action alternative, no impacts to paleontological resources would occur.

Range Management

Affected Environment: The SPGAP project area includes acreage which is part of two allotments: the Battlement Creek Common # 08124 allotment and the Dry Creek Pete and Bill #08125 allotment (Appendix A, Figure 7). These allotments support the cow and calf operations of three current permittees. Permitted grazing use is summarized in Table 11.

Table 11. Range Management Allotments				
<i>Allotment</i>	<i>Permittee</i>	<i>Livestock Kind & Number</i>	<i>Period of Use</i>	<i>Animal Unit Months (AUMs)</i>
Battlement Creek Common # 08124	John & Phyllis Hyrup	Cattle – 53	05/01 – 06/15	80
		Cattle – 5	06/16 – 10/15	20
	James Lemon	Cattle – 100	05/10 – 06/15	122
Dry Creek Pete and Bill # 08125	Sharon Gardner	Cattle – 36	05/01 – 06/15	54
		Cattle – 36	10/01 – 10/31	1
		Cattle – 10	10/01 – 10/31	10
		Cattle – 10	10/01 – 10/31	10
	John & Phyllis Hyrup	Cattle – 182	05/01 – 06/15	275
		Cattle – 182	06/15 – 10/15	22

Proposed Action:

Environmental Consequences: Effects from oil and gas development on livestock grazing include; loss of vegetation for forage, increased human activity, the spread of noxious weeds, and livestock mortality from pits or collisions with project vehicles. A short-term loss of forage would occur as a result of surface disturbing activities associated with the construction of well pads and access roads. There would also be a long-term loss of forage in disturbed areas that are needed for maintenance of gas production over the life of the gas field.

The majority of the effects on livestock grazing in the SPGAP project area would occur on the Dry Creek Pete and Bill Allotment. There would 10 new well pads constructed on this allotment, and 6.5 miles of associated access roads. These activities would result in approximately 99.5 acres of short-term forage loss within the allotment. This loss would persist over a 2- to 3-year period or until grasses and forbs seeded during interim reclamation became productive. Long-term loss, which would last for 20 to 30 years, is estimated to be 31.0 acres

One well and one small segment (0.2 mile) of road would be constructed on the Battlement Creek Common Allotment. This activity would result in the loss of approximately 7.5 acres of forage over the short-term and about 2.75 acres over the long-term. The long-term projected loss of vegetation and forage is not expected to decrease the AUMs on either allotment.

Development and maintenance of the proposed oil and gas facilities would increase human activity in the SPGAP project area. An increase in human activity would cause cattle to move away from locations where the activity is taking place. However, livestock may also benefit from improved access. New roads and pipelines would open access to areas of the allotments that are difficult to get to now because of thick brush and steep slopes. Improvement in livestock distribution could improve forage utilization throughout the allotment.

It is not anticipated that the impacts from implementation of the proposed action would require adjustment of the livestock stocking rate. The level of forage utilization would be monitored on the allotment and if necessary, adjustments in livestock use would be made to protect land health. Appendix E (Number 15) presents standard conditions of approval related to range management resources.

No Action Alternative:

Environmental Consequences: There would be few impacts to range management resources because the developments proposed would not take place.

Realty Authorizations

Affected Environment: Although the South Parachute field has been in a developmental stage for a number of years, BLM right-of-way grants have not been issued for various existing and proposed roads within SPGAP project area. A component of the proposed action would formalize the issuance of certain road and pipeline rights-of-way.

Proposed Action:

Environmental Consequences: Under the proposed action, the ROW authorizations would be granted subject to appropriate terms and conditions. These authorizations would provide EnCana legal access for the construction and use of proposed and existing routes. Standard conditions of approval (Appendix E) would be required for these ROW authorizations.

No Action Alternative:

Environmental Consequences: Since no Federal action would occur under this alternative, EnCana would continue to operate and produce existing gas wells in South Parachute field without proper right-of-way authorizations. This could have adverse effects in terms of road maintenance and use since no binding document currently exists.

Recreation

Affected Environment: The SPGAP project area is located on a combination of private property and public lands administered by the BLM, and offers open space where visitors can participate in primitive or unconfined recreational activities in a relatively undisturbed setting. There are no developed recreational facilities such as campgrounds or picnic areas within the SPGAP project area. The BLM-administered portion of the area includes existing natural gas facilities that consist of production facilities and access roads. Areas that are currently not modified with gas production facilities feature minimal evidence of visitor management and site modifications.

The recreation resource management objectives for public lands in the SPGAP project area are to ensure the continued availability of outdoor recreational opportunities, to reduce the impacts of recreational use on fragile and unique resource values, and to provide for visitor safety (USDI 1984).

The project area is classified Semi-Primitive Motorized (SPM) recreation opportunity class as designated through the BLM Recreation Opportunity Spectrum (ROS) classification system for recreational lands.

The SPGAP project area is within areas managed as both Semi-Primitive Motorized (SPM) and Roaded Natural (RN) as designated by the BLM Recreation Opportunity Spectrum classification system (ROS) (USDI 1984). Semi-Primitive Motorized settings are characterized by a predominantly natural or natural appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions may be present, but would be subtle. Motorized use of local primitive or collector roads with predominantly natural surfaces and trails suitable for motor bikes is permitted. Experience opportunities provide for isolation from the sights and sounds of man, with a high degree of interaction with the natural environment. Motorized uses are permitted.

Roaded Natural settings are characterized by predominantly natural-appearing environments with moderate evidence of the sights and sounds of people. Such evidence usually harmonizes with the natural environment. Interaction between users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities.

The SPGAP project area is within an Extensive Recreation Management Area (ERMA), where recreation is a significant activity but not the principal management focus. Management direction for the ERMA is to “provide visitor information, minimal sanitation facilities and access [and to] manage ERMA to resolve management issues and for off-road [vehicle] (ORV) use” (USDI 1984).

The primary recreational use of the SPGAP is seasonal big game hunting. Hunting is managed by the Colorado Division of Wildlife from the end of August through January. Primary hunting opportunities are for elk, mule deer, and bear. Bow hunting is permitted early in the season. Participation in other dispersed recreational activities in the SPGAP is low, although portions of the area are managed for OHV uses. Other dispersed activities include wildlife viewing, mountain biking, hiking, and horseback riding. Winter snowfall is inadequate to support snowshoeing, snowmobiling, or cross-country skiing. Although data on recreational visitation are not available,

overall use levels are generally low (USDI 2006). According to BLM records, one commercial outfitter holds a permit to guide hunters on BLM lands in the SPGAP project area.

Proposed Action:

Environmental Consequences: Short-term project-related construction, drilling, and completion activities would generate vehicle traffic, dust, noise, and increased human activity in the SPGAP area. Since hunting relies on the presence of game species and hunters generally prefer relatively quiet settings, it is likely that construction and well drilling activities would disrupt hunting in localized areas within about one mile of those activities. Both game species and hunters would likely avoid active construction areas and well drilling activities and would be displaced to other locations within and outside the SPGAP. Similarly, OHV riders and other types of recreational visitors could choose to recreate in other locations over the short-term due to the presence of heavy trucks and intensive human activity.

Changes in the physical and social recreation setting would impact the recreational experience of traditional users, especially big game hunters, due to displacement of big game animals. Hunters may be replaced by recreational users seeking different activity opportunities and experiences.

Changes in recreation resource setting conditions would have a negative impact on an existing special use permit holder, Cache Creek Outfitters. Cache Creek Outfitters conducts big game hunting expeditions within the project area on BLM lands and on the White River National Forest, with 684 service days for big game hunting and 150 days of summer use. The business has one base camp (i.e., Spruce Creek Camp) about 10 miles east of the project area on BLM lands. They are also permitted for five camps on adjacent National Forest lands. Reductions in the demand for hunting expeditions would likely coincide with the anticipated changes in the physical and social recreation setting of the area.

Over the operational life of the project, the presence of natural gas wells, production equipment, and other facilities would change the character of SPGAP area landscapes from natural and undeveloped to relatively altered and developed, at least in areas where these facilities would be visible. This change in the character of the SPGAP project area could diminish the recreational experience for visitors near well pad locations. The physical, social, and administrative setting components of both Semi-Primitive Motorized and Roaded Natural ROS settings would shift closer to a Rural ROS setting because of landscape modifications, use, and the more evident sights and sounds of development.

The addition of project-related access roads, however, could increase motorized public access to portions of the SPGAP and facilitate various types of public recreational uses such as car camping and sightseeing. Essentially, areas only accessible to high clearance 4-wheel drive vehicles and OHVs would become accessible to automobiles. A total of about 6.7 miles of new access roads would be constructed, although some of these roads would be gated and access restricted.

Finally, there is the potential that conflicts between hunting and project activities could arise. If hunters were to discharge their firearms in close proximity to active project locations, the potential for accidents would increase.

Appendix E (Number 16) presents standard conditions of approval related to recreation resources.

No Action Alternative:

Environmental Consequences: With the lack of additional construction activity occurring, impacts to recreation would not be expected to change from the present condition. Any increase in drilling activity on private land within SPGAP could adversely affect the current conditions, however.

Socio-Economics

Affected Environment: The SPGAP project area is located within Garfield County, Colorado. The population of Garfield County has grown by approximately 2.8 percent per year from 2000 to 2005, resulting in an increase from 44,300 to 51,000 residents (U.S. Bureau of the Census 2005). The annual population growth rate is projected to decline gradually through the year 2030, growing to a population of about 97,000 by that time (Colorado Department of Local Affairs 2003).

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 the year 2001, an estimated 239 persons were employed within the mining industry in Garfield County.

In the year 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.

Proposed Action:

Environmental Consequences: The proposed action would positively impact the local economies of Garfield County through the creation of additional job opportunities in the oil and gas industry and in supporting trades and services. In addition, local governments in Garfield County would experience an increase in tax and royalty revenues.

Some minor economic loss to private land owners and a permitted outfitter and guide may result from the potential displacement of big game and resulting reduction in big game hunting within the project area.

The proposed action could result in negative social impacts including: 1) a change in the recreational character of the area (see **Recreation**), 2) reducing scenic quality (see **Visual Resources**), 3) increased dust levels especially during construction (see **Air Quality**), and 4) increasing traffic (see **Transportation**).

No Action Alternative:

Environmental Consequences: With no additional construction or drilling work occurring on public lands, the present economic conditions would change only in a minor way, subject to any additional drilling on nearby private land. There would be little, if any, expansion of job opportunities. Local governments would not benefit from Federal mineral royalties because the proposed developments would not occur.

On the other hand, landowners and permitted outfitters and guides should not be impacted because the displacement of big game should not increase. This alternative would cause only nominal social impacts because there would be little change in the existing recreational character of the area, further reductions in the scenic quality of the area would not occur, and dust levels and traffic would not increase.

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

Affected Environment: Ten discrete soil associations are found within the SPGAP project area (Appendix A, Figure 8 and Table 12). Of these six are considered to be fragile soils with severe to very severe erosion potential. These soils are sensitive to surface disturbance, such as vegetation removal, grading, road building, or cut-and-fill excavation. Erosion is a particular concern on slopes of greater than 30 percent.

Table 12. Soil Associations in the SPGAP.			
<i>Map Unit Number- Soil Association Name</i>	<i>Soil Description</i>	<i>Slope</i>	<i>Erosion Potential</i>
9 - Badland	Very shallow, poorly drained areas showing no soil characteristics; formed from residuum derived from highly calcareous and gypsiferous shale and bentonite. Surface runoff is rated as very rapid.	10-65%	Very severe
12 - Bucklon-Inchau Loam	Shallow well-drained soils formed in sandstone and shale residuum. Found on ridges and mountainsides. Surface runoff is rated as medium.	25-50%	Severe
33 - Ildefonso Stony Loam	Deep, well-drained soil found on mesas, sides of valleys and alluvial fans; formed in mixed alluvium derived primarily from basalt. Surface runoff is medium.	6-25%	Moderate
34 - Ildefonso Stony Loam	Deep, well-drained hill to steep soil on mesa breaks, sides of valleys, and alluvial fans; formed in mixed alluvium derived primarily from basalt. Surface runoff is medium.	25-45%	Severe
55 - Potts loam	Deep, well-drained soils formed in alluvium derived from sandstone, shale, or basalt. Found on mesas, benches, and sides of valleys. Surface runoff is rated as slow.	3-6%	Moderate
56 - Potts Loam	Deep, well-drained soils formed in alluvium derived from sandstone, shale, or basalt. Found on mesas, benches, and sides of valleys. Surface runoff is rated as medium.	6-12%	Severe
58 - Potts-Ildefonso Complex	Hilly to very steep soils on alluvial fans and sides of valleys. Combination of two soils. Potts soil (60%) formed in alluvium derived from sandstone, shale, or basalt; the Ildefonso soil (30%) formed in very strongly calcareous, basaltic alluvium and little eolian material. Surface runoff is medium to rapid.	12-25%	Moderate
66 - Torriorthents-Camborthids-	Exposed sandstone and shale bedrock, loose stones, and shallow to deep stony loams and clay found on toe slopes and concave open areas on foothills and mountainsides.	15-70%	Severe

Table 12. Soil Associations in the SPGAP.			
<i>Map Unit Number- Soil Association Name</i>	<i>Soil Description</i>	<i>Slope</i>	<i>Erosion Potential</i>
Rock outcrop complex	Runoff is very rapid.		
67 - Torriorthents-Rock outcrop complex	Exposed sandstone and shale bedrock, loose stones, and shallow to deep stony loams and clay found on toe slopes and concave open areas on foothills and mountainsides. Runoff is very rapid.	15-70%	Severe
71 - Villa Grove-Zoltay loams	Deep, well-drained soils formed in mixed alluvium. Found on alluvial fans and mountainsides. Surface runoff is rated as slow.	15-30%	Slight to moderate

Four of the nine leases associated with the SPGAP project area include stipulations that require adequate protection of steep slopes and fragile soils (Table 13). Table 13 provides a list of the proposed developments where adequate protection of soils is required. In addition, four other well pads and associated access roads would be constructed on fragile soils (PB22, PN20, PI19, and PH28) where no lease stipulations apply.

Table 13. Proposed Developments on Fragile Soils .					
<i>Lease</i>	<i>Proposed Feature</i>	<i>Well Pad</i>	<i>SMU</i>	<i>Erosion Hazard</i>	<i>Slope</i>
COC27823	Well Pad	PL30	34	Severe	NA
	Access Road	PL30	56	Severe	NA
	Well Pad	PA31	66	Severe	0-30
	Access Road	PA31	66	Severe	30-50
COC27825	Access Road to PM19		56	Severe	0-30
	Well Pad	PG25	34	Severe	0-30
	Well Pad	PG25	66	Severe	30-50
COC27826	Well Pad	PN36	66	Severe	0-30
COC33291	Well Pad	PM19	67	Severe	0-30
	Access Road	PM19	67	Severe	0-30

Proposed Action:

Environmental Consequences: Effects on soils would be primarily associated with the construction of roads and well pads, which would require clearing vegetation, and the excavation, stockpiling, compacting, and redistribution of soils during construction. The most important potential consequence of this disturbance would be an increase in erosion and offsite sedimentation. Potential increases in erosion and sedimentation would vary across the SPGAP area depending on the slope steepness erosion potential of the soil. The potential would be greatest where proposed construction activities coincide with steep slopes and fragile soils.

The proposed activities with the highest potential to result in increased erosion and sedimentation would include the proposed developments associated proposed well pads PH28, PN36, and PB22. This is because the developments would be located on fragile soils in proximity to ephemeral

drainages. In these cases, the greatest risk would occur when the most soil is exposed, especially during periods of heavy or protracted precipitation. This would be between the time construction is completed and vegetation is reestablished. After successful revegetation, the erosion rate and potential sediment yield would drop to near baseline conditions but would remain at slightly elevated levels due to the presence of new access roads. The mitigation measures presented in Appendix E (Number 7-9) would be implemented to minimize the potential for sediment transport and offsite sedimentation.

No Action Alternative:

The no action alternative would involve no new surface disturbance and would result in no additional sediment available for transport.

Analysis of the Public Land Health Standard for Upland Soils: Soils were in acceptable condition on a landscape scale (USDI 2000). A few site specific problems with soil conditions were noted, but these were attributed primarily to road runoff (USDI 2000). The proposed action with associated mitigation, and the no action alternative, would not likely prevent the Public Land Health Standard for Upland Soils from being met.

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

Affected Environment: The native vegetation in the SPGAP project area ranges from mixed grasses and shrubs on the uplands and mesas to pinyon-juniper (*Juniperus osteosperma* and *Pinus edulis*) woodlands at higher elevations. Mixed grasses are found in meadows and in the understory of the shrubland and pinyon-juniper communities and include western wheatgrass (*Pascopyrum smithii*), crested wheatgrass (*Agropyron cristatum*), slender wheatgrass (*Elymus trachycaulus*), and Indian ricegrass (*Achnatherum hymenoides*). The shrubs are primarily big sagebrush (*Artemisia tridentata*), Gambel oak (*Quercus gambelii*), greasewood (*Sarcobatus vermiculatus*), and rabbitbrush (*Chrysothamnus nauseosus*).

Higher elevation shrubland communities include mountain mahogany (*Cercocarpus montanus*), serviceberry (*Amelanchier alnifolia*), chokecherry (*Prunus virginiana*), and snowberry (*Symphoricarpos rotundifolius*). The few riparian areas located in the SPGAP area contain mountain maple, quaking aspen, narrowleaf cottonwood, chokecherry, skunkbrush sumac, red-osier dogwood, and various willows (see **Wetlands and Riparian Zones**).

The SPGAP project area also contains numerous non-native species. Noxious and invasive species include cheatgrass (*Bromus tectorum*), musk thistle (*Carduus nutans*), salt-cedar (*Tamarix ramosissima*), diffuse knapweed (*Centaurea diffusa*), Canada thistle (*Cirsium arvense*), field bindweed (*Convolvulus arvensis*), Russian thistle (*Salsola iberica*), and common mullein (*Verbascum thapsus*) (see **Invasive, Non-Native Species**). The entire SPGAP area has, to some extent, been affected by cheatgrass. It is often associated with sagebrush communities and disturbed areas, especially road banks. In the pinyon-juniper woodlands, this species may be found as the primary understory component.

Like many areas of Colorado, numerous pinyon pines in the SPGAP project area have suffered from engraver beetle (*Ips confusus*) infestation. *Ips* beetles are bark beetles that specifically damage pinyon pine by boring under the bark and producing egg galleries that have a girdling effect on the tree's cambium layer. This girdling causes a loss of nutrient flow in the tree, resulting in mortality (Cranshaw and Leatherman 2006).

Vegetation in parts of the SPGAP project area was affected by the Battlement Creek Fire of 1987. The fire destroyed vegetation in the vicinity of proposed well pads PI19, PK21, and PB22 and along their proposed access roads. These areas contain numerous juniper snags and are particularly infested with cheatgrass. Grasses and shrubs have re-established in the burned area and numerous seeded species are abundant including alfalfa (*Medicago sativa*), western wheat (*Pascopyrum smithii*) and smooth brome (*Bromus inermis*).

Proposed Action:

Environmental Consequences: Construction of the proposed pads, pipelines, and access roads would result in both direct and indirect effects to vegetation. Direct effects would include short- and long-term loss of vegetation and long-term modification of community structure and composition. Approximately 107 acres of vegetation would be disturbed over the short-term by the construction activities associated with the proposed action. Assuming that interim reclamation was successful, the loss in vegetation would be reduced to approximately 33.8 acres after a 2- to 3-year period. The long-term loss would persist over the 20- to 30-year life of the project.

These disturbances, followed by reclamation, would alter the species composition by replacing diverse native communities with reclamation species that have a better chance of establishing ground cover in a short timeframe. These shifts in vegetation patterns would result in a reduction in biodiversity within and near disturbed areas and could result in decreased quality of habitats for wildlife. Revegetation of shrub species would take at least 8 years, and pinyon-juniper woodlands could take more than 100 years to re-establish. Pinyon-juniper woodlands and shrublands, and even native grasslands, would remain in a low diversity state for an extended period (i.e., years to decades) until recruitment of natural plant species re-establishes the pre-disturbance level of diversity.

Indirect effects could include increased potential for noxious weed invasion, and increased soil erosion and sedimentation. These impacts are described in the sections titled, **Invasive, Non-Native Species and Soils**. Mitigation measures designed to reduce impact to vegetation are presented in Appendix E (Numbers 5, 7, and 17).

The tamarisk treatment element of the proposed action would have no impact on vegetation in the SPGAP area. However, tamarisk would be greatly reduced or eliminated from the 250-acre treatment area along the Colorado River floodplain. These treatments would contribute in a modest way to improving species diversity and riparian function condition along the floodplain.

No Action Alternative:

Environmental Consequences: Under the no action alternative, the disturbances described in the proposed action would not take place and no impacts to vegetation would occur.

Analysis of the Public Land Health Standard for Plant Communities: A health assessment was completed on the lands affected by the SPGAP (USDI 2000). The results of the study indicated that vegetative communities are not meeting the land health standard. The problems are most widespread in sagebrush and shadscale communities and pinyon-juniper woodlands. On the sagebrush sites, species, lifeform, and age class diversity is lacking. Few perennial grasses or forbs are found. Cheatgrass is frequently dominant on the sites. Several sagebrush stands have healthy vigorous sagebrush with good recruitment of sage seedlings, but sagebrush on most sites is moderately to heavily hedged and lacking in vigor and reproduction. A number of the

sagebrush sites are being invaded by young juniper and pinyon pine trees. These sites varied in terms of the degree of encroachment, but eventually these sites will become dominated by pinyon-juniper unless something is done to set back succession and regenerate the sagebrush.

Most of the pinyon-juniper woodlands consist of mature Utah juniper with lesser amounts of pinyon pine. Most of these woodland sites have very few understory species present. Perennial grasses and forbs are generally minimal or absent, and where shrubs are present, often they are decadent or in poor vigor. Age class diversity is poor with most plants in the mature to overmature stage with little recruitment and establishment of younger age classes. Cheatgrass is abundant and occasionally dominant under the tree canopy (USDI 2000).

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 neither move the area toward or away from meeting the standard because no new disturbances, but no enhancements, would take place.

Visual Resources

Affected Environment: The proposed action would take place on both public and private lands within areas classified by the BLM as Visual Resource Management (VRM) Classes II, III, IV and V (USDI 1984).

Visual Resource Management Objectives

VRM Class II areas are managed to retain the existing character of the landscape. The level of change to the characteristic landscape resulting from Federal or federally approved actions should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. Approximately 15-20% of the project area, which would include the proposed PI19 pad and its associated access road, is classified as VRM Class II (Appendix A, Figure 9).

VRM Class III areas are managed to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may 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. About 35-40% of the project area, including the proposed location of pads PM19, PK21, PA31, PB22 and PH28, is classified as VRM Class III (see Appendix A, Figure 9).

The management of visual resources in Class IV areas allows for major modifications of the existing character of the landscape. In these areas, alterations may dominate the view and may be the major focus of viewer attention. However, attempts should be made to minimize impacts in Class IV areas through careful project design aimed at minimizing disturbance and repeating basic landscape elements. Approximately 35-40% of the project area is classified as Class IV, which would include the proposed location of pads PG25, PL30, PA31, PN31 and PN36 (see Appendix A, Figure 9). The VRM Class V designation is applied to areas where the natural character of the landscape has been disturbed to a point where rehabilitation is needed to bring it up to one of the four other classifications. The classification also applies to areas where there is potential to increase the landscape's visual quality. It is often used as an interim classification until objectives of another class can be reached. Less than 5% of the project area is classified as

a Class V visual resource management area. None of the proposed developments would be in Class V, although the existing PN29 pad lies within this area (see Appendix A, Figure 9).

Visual resource management objectives do not apply to non-BLM lands, but visual concerns may be addressed on split estate where federal mineral occur. 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.

Existing Landscape Character and Scenic Quality

The scenic quality of the SPGAP area is moderate to high, primarily because of the diversity of characteristic landforms, including mesas and steep slopes, and dramatic rock formations located at higher elevations. The SPGAP area is characterized by alternating northeast-southwest trending ridges and drainages that flow into the Colorado River. Flat terraces and rolling hills rise behind the valley to the steeply sloping uplands of Battlement Mesa. Vegetation communities are dominated by pinyon-juniper interspersed with sagebrush. In general, vegetation within the SPGAP area increases in density and variety as elevation increases. The landscape colors are dominated by tan, gold, and green vegetation, and grey-tan soils. The colors and values (i.e., degrees of lightness and darkness) of the soils and vegetation are similar and exhibit little contrast during most months of the year. In spring and early summer, greening vegetation displays the greatest color contrasts with the areas soils. The area also contains several old burns resulting from wildfire, these areas provide natural mosaic openings within the pinyon-juniper vegetation.

The entire SPGAP area is located within foreground and middle-ground distance zones from sensitive viewing areas such as I-70 and residential areas along the I-70 corridor. Existing visual modifications to the area result from the construction of natural gas production facilities and associated well pads and access roads. Some facilities are readily visible in the foreground distance zone (i.e., 0 to 3.0 miles) of nearby residences and county roads. In the middle-ground distance zone (i.e., 3 to 5 miles), existing well pads and access roads are the most obvious features of natural gas development. Well pads and roads are visible as light brownish-gray, geometric clearings with straight, linear edges that provide a contrast with the surrounding vegetation. Cut-and-fill areas that face observers are visible as steep, disturbed slopes.

There are 16 existing well pads with one or more producing wells served by existing access roads and pipelines on both public and private lands. Considerable existing well development and associated access roads occur on private lands adjacent to the SPGAP area. Most of the existing visual impacts to viewers on I-70 and residences south of the highway are related to natural gas development on private lands because viewing areas are fairly close to developments, and the relatively flat terrain of the valley floor provides unimpeded views of natural gas facilities from I-70 and residential areas.

Sensitive Viewing Areas

Transportation Routes

The SPGAP project area is located between 0.75 and 5 miles from I-70. Both east and west-bound lanes of I-70 provide views of slopes within the SPGAP area. Motorists on I-70 would have a view of the SPGAP area from a 6.5-mile segment of highway between Spring Creek and Battlement Creek. Streams within the SPGAP drain northwest into the Colorado River, so that east-bound motorists would be afforded a view up some drainages. Views up drainages for west-bound viewers would be blocked by terraces and ridges. Views from the highway extend about

8.5 miles to the south to include expansive views of the valley bottom and the northwest-facing terraces and slopes of the SPGAP area that provide a backdrop to the valley bottom. The view extends beyond the project area to encompass the high peaks above Battlement Mesa.

The 60-degree viewshed of the typical interstate driver includes a relatively small portion of the Colorado River Valley in the immediate foreground view, and the northwest to west-facing slopes of the SPGAP area in the middle-ground views. However, even though much of the project area is outside the typical 60-degree viewshed, the valley, the backdrops of Battlement Mesa, and the high peaks beyond, are scenic landscapes that provide broad views that are in contrast to more constricted views west of Spring Creek and north of Battlement Creek. It is likely that the attention of many motorists would be drawn toward the SPGAP project area.

Residential Areas

The Town of Parachute is located on the north and south sides of I-70 within the lower elevations of the Colorado River Valley. Most residential areas in the town have unimpeded views of the SPGAP area; however, views from portions of the town north of I-70 are screened by the highway.

Residential subdivisions that provide views of the project area include the Battlement Mesa and Morrisania Mesa, both located south of I-70. There are also numerous isolated rural residences located between these communities. These residences are located north and west of the SPGAP area along county roads.

Key Observation Points

The greatest number of viewers of the proposed natural gas facilities would be motorists traveling on I-70, motorists on local roads located between I-70 and the SPGAP area, and residents of Battlement Mesa, Morrisania Mesa, and the Town of Parachute. The portion of the SPGAP area that has the highest level of sensitivity to landscape modification occurs on slopes that face the highway and residential areas. Key Observation Points (KOPs) used for this analysis are the I-70 corridor, the communities of Battlement Mesa, Morrisania Mesa, the Town of Parachute, and County Roads (CR) 300, 301, 302, and 308.

Proposed Action:

Environmental Consequences: Short-term visual impacts from construction, drilling, and completion activities would occur on all new pads, as well as on existing pads with proposed new wells. The existing landscape would be changed by the introduction of new elements of line, color, form, and texture. New pads and other surface facilities, new roads, and new pipelines would increase the presence of drilling rigs, heavy equipment (e.g., dozers, graders, etc.), and vehicular traffic, with an associated increase in dust, light pollution, and well flaring.

Construction would occur over a 2- to 3-year period. At a given location, activity would occur 24 hours per day for the 30- to 60-day drilling and completion phases. 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.

Long-term impacts of the proposed action would consist of reduced visual character within portions of the landscape where new pad facilities, pipelines, and roads cannot be screened from sight. The visibility of new areas of surface disturbance and production equipment would

increase the existing visual contrasts associated with human modifications already present in the SPGAP project area. Interim reclamation (Appendix E, Number 7), site-specific mitigation (Appendix F), as well as the use of natural colors on production equipment (see Appendix E, Number 18), would largely mitigate long-term impacts.

Most well development would occur at elevations higher than any viewing areas, so that the disturbed surface of the well pads and the facilities on the pad would not be visible. However, cuts and fills at many of the proposed surface locations would face towards KOPs I-70 and residential areas south of the highway, and would potentially be visible even at those locations where the pad is at a higher elevation than the affected viewing area. In general, cut-and-fill slopes of more than 20 feet would have the greatest impact, primarily because of the height of the slopes and the low height of potential screening vegetation in the SPGAP area, which usually does not exceed 15-20 feet in height.

The majority of proposed surface locations are between 0.5 and 3.5 miles from any residential areas and more than 1 mile from I-70. Cut-and-fill areas that are located more than 1 mile from residential areas and the highway would be minor features that would be subordinate to the surrounding landscape. Once revegetated, cuts and fills located at a distance greater than 1 mile from sensitive viewing areas would be difficult to distinguish from the surrounding landscape, and would not be noticeable to the casual viewer. The well pads and aboveground production facilities with the greatest potential to affect viewers at KOPs viewing areas are those located within 1 mile.

The most visible well pads in the SPGAP project area (i.e., PI19 and PM19) would be on the lower slopes within foreground distance zones, as seen from most KOPs and residences in the Battlement Mesa community. None of the proposed pads or facilities would be visible from residences in Morrisania Mesa. Cuts and fills associated with well pads and access roads have the potential to be visible, to some degree, due to the creation of straight-line contrasts with the surrounding landscape. Aboveground facilities located between 2 and 3 miles from all viewpoints would be very difficult to discern by most viewers because the scale of the facilities would be small relative to the surrounding landscape. Cuts and fills associated with access roads and well pads would be visible at these distances if they face the viewpoint with no intervening features. Facilities located at a distance greater than 3 miles from sensitive viewing areas are too distant to be discernible. Facilities located in the seldom-seen distance zone are hidden by the terrain or would appear too small to perceive.

The majority of effects on the landscape that would be visible from KOPs would occur from permanent well pad clearings, associated infrastructure, and access roads within the immediate foreground zones (i.e., 0 to 0.5 mile) of sensitive viewing areas. There would be two well pads (PI19 and PM19) and associated access roads located within 0.5 mile residences along KOP CR 300 near Battlement Mesa. These would be located on gentle, north-facing slopes oriented toward the residences. Both of these well pads and roads would be located between 1 to 1.5 miles from I-70.

Site Specific Analysis and Mitigation:

The proposed PI19 pad and associated access road would be located within a VRM Class II area and would be visible from most of the KOPs during construction and completion activities. Short term contrasts in line, color, and texture resulting from vegetation clearing and cut-and-fills for portions of the pad and access road are expected. The original location of the pad and access road were moved to mitigate visual impacts.

A high degree of contrast could result from fills along the north side of the pad. In order to reduce these contrasts, trees should be left standing in the fill slopes along the NW corner. In addition, dark colored matting will be required to be placed on visible cuts and fills soon after construction after construction of the pad. Specific mitigation measures are included as COAs in Appendix F to decrease long term contrasts to line, color, and texture. With successful mitigation and reclamation efforts this pad and access road would meet VRM Class II objectives.

The proposed PM-19 pad would be located within a VRM Class III area and would be highly visible during construction and completion activities from all of the KOPs except Morrisania Mesa. The pad is located in an old burn adjacent to a distinctive remaining vegetation line on north facing slopes in an area slightly higher in elevation than nearby residences along KOP CR 300. The access road would also be highly visible on a north-facing slope on both private and public lands. Short term impacts resulting from a high degree of contrasts in color, line, form, and texture resulting from vegetation removal and cuts and fills (25 foot cuts and fills) are expected to exceed VRM Class III objectives due to the close proximity to KOPs and sensitive viewsheds. In order to reduce a high degree of short term contrasts from dominating the landscape, dark colored matting or application of a dark color on exposed soils will be required to be placed on visible cuts and fills soon after construction on both the pad and along the access road. Long term impacts are expected to meet VRM Class III objectives with successful reclamation and specific mitigation measures included as COAs in Appendix F.

The PK-21 pad is also proposed in a VRM Class III area within the viewshed of residences to the northwest and I-70. This pad is located in an old burn area back-dropped by a diverse landscape consisting of horizontal rock outcrops, steep and slumping slopes, numerous rock formations, and a variety of color and forms. The proposed access road would be routed through private property across drainages onto BLM-administered lands. A high degree of contrast could result from cuts and fills along the road and along the north side of the pad. In order to reduce contrasts, trees located along the western edge of the proposed pad should be retained. To reduce a high degree of contrast, trees should be saved adjacent to the excess material pile. With the successful reclamation efforts and the mitigation measure brought forward as COAs in Appendix F this location and access road would meet VRM Class III objectives.

The PB-22, PH-28, and the PA-31 pads would also be located within VRM Class III areas. While these pads may be visible in the short-term, the contrasts would not dominate the landscape in the long-term. These pads and access roads would meet VRM Class III objectives after successful reclamation.

The PG-25, PN-31, PN-36, PL-30, PA-31 pads would be located within VRM Class IV areas. The PN-31 pad may be visible in background distance views from I-70 during construction, drilling, and completion activities. The other locations would not be visible from any of the KOPs. Long-term impacts would meet VRM Class IV objectives for all of these locations.

The PN-29 is within a VRM Class V area and would not be visible from any KOPs. This site and access road would meet VRM Class V objectives.

No Action Alternative:

Environmental Consequences: Under the no action alternative, none of the developed described under the proposed action would be authorized and no new surface disturbance on public lands would occur. Visual resources would remain unchanged from present conditions.

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

Affected Environment: Three intermittent streams, Pete and Bill Creek, Dry Creek, and Monument Gulch intersect the project area (see Appendix A, Figure 6). There are no perennial streams and, therefore, fish populations are not present. However, all three of the streams drain into the Colorado River which supports federally listed and BLM sensitive fish species, as well as a variety of other fish and aquatic invertebrates.

Proposed Action:

Environmental Consequences: Since streams within the project area are intermittent, the proposed action would not have direct impacts on aquatic wildlife. However, potential effects on fish and aquatic invertebrates in the Colorado River, which is approximately 0.25 mile north and west of the SPGAP project area, could result from transport of sediments. This could result in the smothering of eggs, and/or the reduction of oxygen exchange. Since many aquatic invertebrates and native fishes are detritus feeders during some stages of development, removal of vegetation could decrease available sources of food for these species. Sediment also reduces aquatic insect productivity which could also impact food resources for fish species.

The small amount of sediment that would ultimately reach the Colorado River should have minimal impact on fisheries, because sediment levels are projected to be well within the background levels for the Colorado River. Minor increases in sediment produced from the action would be undetectable. However, as similar natural gas development activity continues within the Colorado River, increases in sediment may have a greater impact on sediment intolerant aquatic species. Mitigation measures presented in Appendix E (Numbers 7-9) would minimize impacts associated with sedimentation.

No Action Alternative:

Environmental Consequences: The no action alternative would have no impact on aquatic wildlife, because the development activities described in the proposed action would not occur.

Analysis on the Public Land Health Standard 3 for Plant and Animal Communities (partial, see also **Vegetation and Wildlife, Terrestrial**). The health of aquatic species (fish and aquatic invertebrates) is affected by soil, water quality, and vegetation. According to the 2000 Battlement Mesa Land Health Assessment, existing water quality in Pete and Bill Creek, Dry Creek and Monument Gulch does not exceed the standards established for the classified uses. The soils in the area appear stable and functioning with no significant problems regarding indicators of soil health. Much of the terrestrial vegetation in the Battlement Mesa area is functioning at risk. Riparian vegetation, however, is achieving the standard. With the implementation of the mitigation measures discussed in the water quality, soil, vegetation, and wildlife sections of this EA, the condition of aquatic wildlife would not be expected to show a downward trend.

The no action alternative would have no bearing on the ability of the area to meet Standard 3, because no new developments would occur.

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

Affected Environment: Big game species found in the project area include mule deer (*Odocoileus hemionus*), Rocky Mountain elk (*Cervus elaphus nelsoni*), and black bear (*Ursus americanus*).

According to the Battlement Mesa Land Health Assessment, many areas, including the project area, were considered to be functioning at risk due to the lack of diversity and density of native plant and animal species and the dominance of some sites by noxious weeds and other undesirable species (USDI 2000). Data indicates that the area does not appear to be declining further nor is substantial improvement occurring.

The Colorado Division of Wildlife (CDOW) is responsible for managing wildlife populations in the state and manages big game within specific Data Analysis Units (DAUs). Each DAU comprises smaller, more manageable units known as Game Management Units (GMUs). The SPGAP project area lies within deer DAU D-12, GMU 42 and elk DAU E-14, GMU 42. Population estimates of these species are reviewed periodically to determine management objectives based on the carrying capacity of existing habitat. From this assessment, a determination of the number of individuals of each species within each DAU is established. In 2005, DAU D-12 was considered to be 11-20% under the population long-term objective (LTO) of 29,500 individuals. The projected 2005 population for DAU D-12 was 26,340 individuals; the harvest objective was 1,600 individuals (CDOW 2006). Elk numbers in DAU E-14 and throughout Colorado are above the statewide LTO.

Information on elk and mule deer seasonal activity areas was researched and downloaded from the CDOW's Wildlife Resource Inventory System (WRIS) for several types of habitats: summer range, winter range, summer concentration areas, winter concentration areas, severe winter range, calving or fawning areas, and migration corridors.

Elk seasonal use areas in the project area include the following (Appendix A, Figure 10):

- Elk Summer Range – Includes approximately 153 acres along the eastern edge of the project area.
- Elk Winter Range – Most of the project area and all of the proposed developments are located within elk winter range.
- Elk Winter Concentration Area – Approximately 3,206 acres, primary in the northern part of the project area, are elk winter concentration areas.
- Elk Severe Winter Range – Approximately 19 acres in the northeastern corner of the project area is classified as severe winter range.

Mule deer seasonal use areas in the project area include the following (Appendix A, Figure 11):

- Mule Deer Summer Range – Includes approximately 558 acres in the eastern corner of the project area.
- Mule Deer Winter Range – Most of the project area is classified as mule deer winter range.
- Mule Deer Winter Concentration Area – Approximately 1,898 acres in the northwestern part of the project area are designated as mule deer winter concentration areas.
- Mule Deer Severe Winter Range – Approximately 938 acres in the northwestern part of the project area are designated as mule deer severe winter range.

A black bear fall concentration area is also located in the project area (Appendix A, Figure 12). A black bear fall concentration area consists of that portion of the overall range occupied from August 15th until September 30th. During this time of the year, black bear ingest large quantities of mast and berries to establish fat reserves in preparation for winter hibernation.

- Black Bear Fall Concentration Area – Approximately 460 acres in the eastern portion of the project area would be within a black bear fall concentration area.

Existing well pads and associated access roads that are within the black bear fall concentration area include PL28 and PJ28. Proposed well pad PH28 and an associated pipeline are also in the area.

Federal leases COC27823, COC27825, and COC27826 carry big game winter habitat Timing Limitation (TL) stipulations that preclude exploration, drilling, and development activity from January 1 through May 31. This stipulation would apply to the development of proposed pads PN31, PG25, and PN36 and the further development of existing pads PD31, PF31, PH25, and PK25 and all or portions of their associated access roads and pipelines.

Federal lease COC33291 carries a TL stipulation that prohibits development activities from January 1 through April 30. This stipulation would apply to the development of the proposed PA31 and PM19 pads and associated access roads and pipelines.

The other Federal leases associated with the proposed action (COC01523, COC06266B, COC010075A, COC019572, and COC067090) do not contain TL stipulations for big game winter habitat. Therefore, the proposed development of pads PI19, PK21, PB22, PH28, PL30, and the future development of existing pads PN20, PJ28, PL28, PA29, PF29, PN29, PA30, PJ30, PN30, PB30, PD30, PG30, and PH1 would not be constrained to a certain time period on the basis of lease stipulation.

In view of these complexities, Encana, in consultation with the BLM and the Colorado Division of Wildlife (CDOW) has proposed a 60-day TL period from January 1st to March 1st applicable to all leases in the SPGAP area. During this period, no exploration, drilling, or development activities could take place, although operations and maintenance activity would be permissible.

This proposed change would require a modification of existing stipulations on Federal leases COC27823, COC27825, COC27826, and COC33291 to reflect the shortened TL period. As proposed, the modifications would be effective for a 3-year period or until the SPGAP is fully implemented, whichever comes first. After this time, the modifications would expire and the TL would revert to their originally stipulated periods. The 60-day TL period would be implemented on Federal leases COC06266B, COC010075A, COC01523, COC019572, and COC67090 through conditions of approval (COAs) on individual APDs.

Proposed Action:

Environmental Consequences: Impacts to big game would include direct habitat loss, displacement into less suitable habitat or indirect habitat loss, and increased physiological stress. The proposed action would result in the initial loss or fragmentation of approximately 107 acres of wildlife habitat in the SPGAP area. Following reclamation of pads, pipelines, and access roads, permanent direct habitat loss would be reduced about 33.8 acres. While vegetation provides important habitat for many wildlife species, the vegetative communities found in the project area are widespread throughout this portion of the Lower Colorado River Basin. As such,

these direct habitat losses would not measurably impact the viability of wildlife species in the project area.

However, construction, drilling, and completion operations would likely result in the displacement of wildlife from the area. The extent to which human activity disturbs wildlife varies by species and other factors, such as the timing, intensity, frequency, and duration of disturbance, presence of topographic or vegetation screening, and whether and to what degree habituation occurs. Research has shown that large ungulates reduce their habitat use within 0.125 mile of roads and active developments (USDI 1999b). Assuming this measure is valid, a reduction in habitat use could occur across 2,533 acres or approximately 53% percent of the SPGAP study area.

Displacement could cause big game to use habitats of lower quality during periods when high quality habitats are essential for maintaining a zero energy balance (i.e., during the birthing season and during the winter months). The use of these lower quality habitats during these periods could result in increased mortality amongst both adults and juveniles.

Range adjacent to the SPGAP project area could be indirectly affected and decline in quality as a result of increased use by displaced animals, thereby decreasing the overall carrying capacity of the area (Bartmann et al. 1992, White and Bartmann 1998). Forcing more animals onto remaining areas available for use could also increase the spread of disease within the population. In addition, concurrent gas development in surrounding areas may be reducing areas available to big game on a population level, resulting in less suitable habitat for displaced animals.

Black bear fall concentration habitat would be affected by activities at the existing PL28 and PJ28 well pads and the proposed PH28 pad and access road. These developments would likely result in decreased use of the in the eastern portion of the study area.

Displacement is expected to be greatest during the construction, drilling, and completion phases of development due to high noise levels and the concentrated nature of the activity. The impact would still occur during the production phase due to continued truck traffic and human presence associated with operations and maintenance. However, it would be reduced because noise levels would be substantial lower and activity less concentrated than during construction, drilling, and completion.

Due to the variable TL periods currently in force (ranging from 0- to 5-months), the operator would be encouraged to move developments activities to leases without restrictions during the winter months. This inconsistent level of protection could have a detrimental effect on big game populations because animals would be displaced from one end of the project area to the other throughout the winter months.

Modification to the TL stipulations, in association with COAs implementing a 60-day TL would create a uniform, albeit shorter, period of protection across the SPGAP area, mitigating this type of displacement (Appendix E, Number 19) . However, the shorter TL period could have an adverse impact during the late winter /early spring especially during period of severe weather years.

The tamarisk treatment element of the proposed action would not benefit big game habitat within the SPGAP area. However, the treatments would contribute to enhancing the value of big game habitat at a regional scale and thus would have modest positive impact on the herd unit as a whole.

Mitigation of impacts associated with oil and gas development activity is further guided by the current Glenwood Springs Resource Area Land Use Plan (USDI 1999a) that has assigned a disturbance threshold above which impact reduction measures to big game winter range would be considered:

“Within high value or crucial big game winter range, the operator is required to implement specific measures to reduce impacts of oil and gas operations on wildlife and wildlife habitat....Measures to reduce impacts would generally be considered when well density exceeds four wells [pads] per 640 acres [or 1 pad per 160 acres], or when road density exceeds three miles of road per 640 acres [or 1 mile per 213 acres] (USDI 1999a:15, brackets added).”

Analysis of the proposed action in relation to the pad density threshold indicates that with the full implementation of the proposed action, the SPGAP study area would be slightly below the number of pads needed to equal the threshold density established for big game winter range (Table 14).

Table 14. Relationship of the Proposed Action to the Pad Density Threshold.					
<i>Acres of Winter Range in SPGAP Area*</i>	<i>Number of Existing Well Pads in Winter Range</i>	<i>Number of Proposed well Pads in Winter Range</i>	<i>Total Well Pads in Winter Range</i>	<i>Number of pads to Equal Density Threshold (1 pad/160acres)</i>	<i>Relation to Threshold (well pads)</i>
4,280	10	14	24	27	3 pads below threshold
* All acreage within the SPGAP area, regardless of surface ownership, was included in the analysis. Severe winter range and winter concentration areas were included in the analysis.					

Similarly, evaluation of existing and proposed roads in relation to the road density threshold indicates that if all of the roads presented in the proposed action are constructed, the study area would be just below the mileage needed to equal the road density threshold (Table 15).

Table 15. Relationship of the Proposed Action to the Road Density Threshold.					
<i>Acres of Winter Range in SPGAP Area*</i>	<i>Miles of Existing Roads in Winter Range</i>	<i>Miles of Proposed Roads in Winter Range</i>	<i>Total Miles of Roads in Winter Range</i>	<i>Miles of Roads to Equal Density Threshold (1 mile/213 acres)</i>	<i>Relation to Threshold (miles)</i>
4,280	12.8	5.1	17.9	20.1	2.2 miles below threshold
* All acreage within the SPGAP area, regardless of surface ownership, was included in the analysis. Severe winter range and winter concentration areas were included in the analysis.					

Because the proposed action would not exceed either the well pad or road density thresholds, mitigation measures in addition to those presented in the Appendices E and F need not be considered. However, such measures may need to be considered in the event that additional, future oil-and gas-related developments are proposed in the SPGAP study area.

No Action Alternative:

Environmental Consequences: Under the no action alternative, activity in the SPGAP area would be limited to operations and maintenance associated with currently producing wells. These activities would likely displace wildlife in the vicinity of wells and access roads. However, the impact would be minor because there are relatively few currently producing wells in the area and no new construction, drilling, and completion activities would occur.

Analysis on the Public Land Health Standard for Animal Communities (partial, see also **Vegetation and Wildlife, Aquatic**): According to the land health assessment of the Battlement Mesa Area (USDI 2000), the current condition of fish and wildlife habitats varies across the landscape. Habitats have been altered by roads, power lines, pipelines, fences, residential development, oil and gas development, and livestock and wild ungulate grazing. Sagebrush habitats vary from poor to good condition with evidence of light to heavy use. The sagebrush stands provide important habitat for a variety of wildlife species and are particularly important as food and cover for wintering big game.

Pinyon-juniper habitats also vary in condition. Many sites have a sparse herbaceous understory, while others have a better developed herbaceous component. Pinyon-juniper woodlands are important habitat for nesting raptors and other birds, and provide shelter and cover for a variety of wildlife. According to the assessment, mule deer numbers have decreased dramatically since the late 1980s, while the numbers appear to be increasing for the elk population, which is shifting to a more permanent residency on BLM lands within the Battlement Mesa landscape. In addition, winter range habitats in the area may be at or are above carrying capacity (USDI 2000). The proposed action would add to the disturbance of sagebrush habitats and pinyon-juniper woodlands and is therefore likely to contribute to a downward trend for the Public Land Health Standard for Animal Communities within the SPGAP study area.

The no action alternative would not contribute further to the downward trend because activities would be limited to operations and maintenance on currently producing wells.

SUMMARY OF CUMULATIVE IMPACTS

The *Glenwood Springs Oil and Gas Leasing and Development Final Supplemental EIS* (FSEIS) (BLM 1999b) 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 has had and would continue to have adverse affects on various elements of the human environment. The anticipated impact levels for existing and future actions range from negligible to locally major, and primarily negative, for specific resources. The primary reasons for this assessment are twofold: (1) the rate of development, particularly oil and gas development, is increasing in the area, resulting in an accelerated accumulation of individually nominal effects; and (2) the majority of residential and commercial expansion, as well as oil and gas development, have occurred, and is likely to continue to occur, on private holdings where mitigation measures designed to protect and conserve resources are not in effect.

It is clear that the proposed action would contribute to the collective adverse impact for some resources. Although the contribution would be minor, additional ground disturbance would occur and additional habitat would be lost. Thus, the proposed action would contribute incrementally to the collective impact to vegetation, migratory birds, terrestrial wildlife, and other resources. However, the contribution to the accumulated effects would be minor because mitigation measures represented by the conditions of approval for resource protection are mandated for implementation (Appendices D, E, and F).

FUTURE IMPLEMENTATION ACTIONS USING STATUTORY CATEGORICAL EXCLUSIONS

Section 390 of the Energy Policy Act of 2005 established statutory categorical exclusions (SCEs) under the National Environmental Policy Act (NEPA) that apply to five categories of oil and gas exploration and development on Federal oil and gas leases. The purpose of these SCEs is to streamline the approval process for relatively minor actions in areas where environmental analysis had previously been conducted.

The SCEs apply to five categories of action:

- Individual surface disturbance of less than 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 pursuant to NEPA has been previously conducted,
- Drilling an oil or gas location or well pad at a site at which drilling has occurred within 5 years prior to the date of spudding the well,
- Drilling an oil or gas well within a developed field for which an approved land use plan or any environmental document prepared pursuant to NEPA analyzed drilling as a reasonably foreseeable activity, as long as such plan or document was approved within 5 years prior to the date of spudding the well,
- Placement of a pipeline in an approved right-of-way corridor, so long as the corridor was approved within 5 years prior to the date of placement of the pipeline,
- Maintenance of a minor activity, other than any construction or major renovation of a building or facility.

In reviewing an Application for Permit to Drill (APD), Surface Use Plan of Operations, or pipeline application involving a proposed activity that fits into one of the five categories, the appropriate SCE would be applied, and no further NEPA analysis would be required. However, a structured, interdisciplinary review and approval process, including onsite examinations of all proposed well and road locations and the application of appropriate mitigation and Best Management Practices (BMPs), would apply.

The use of these SCEs would allow EnCana to seek expedited approval of future actions that constitute minor alterations of the proposed SPGAP (e.g., changes in pad configuration or location, minor changes in access routes, changes in the number of wells per pad, alterations in pipeline length or location, etc.). However, new implementation actions beyond the scope and intent of the SCEs would require additional environmental analysis prior to approval.

AGENCIES CONSULTED

The following organizations were consulted during the development of this EA:

- Battlement Mesa Company
- EnCana Oil & Gas (USA) Inc.
- Garfield County Board of Commissioners
- Colorado Division of Wildlife
- Colorado Mule Deer Association
- Colorado State Historic Preservation Officer
- Northern Ute Tribe (Uintah and Ouray Bands of the Ute Tribe)
- Southern Ute Tribe
- Ute Mountain Ute Tribe
- Town of Parachute
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- Wasatch Surveying

LIST OF PREPARERS AND INTERDISCIPLINARY REVIEW

This EA was drafted by Greystone Environmental Consultants (Greystone), an ARCADIS Company, serving as a third-party NEPA contractor to the BLM (Table 16). Resource management direction and final EA review was provided by BLM resource specialists as noted in Table 17.

Table 16. List of Greystone/ARCADIS Preparers	
<i>Resource Parameter/Area of Responsibility</i>	<i>Responsible Person</i>
Project Management	Kathy Wilkerson
Assistant Project Management, Special Status Species, Migratory Birds, Wildlife, Aquatic and Terrestrial	Pat Golden
Hydrology, Floodplains, Wetlands and Riparian Zones, Geology and Minerals, Invasive Species, Wastes, Water Quality, Wild and Scenic Rivers, Wilderness, Soils, and Vegetation	Selina Koler
Visual Resources, Socioeconomics, Access and Transportation, Travel, Recreation, ACECs, and Environmental Justice	Lisa Welch
Air Quality and Noise	Gordon Frisbie
Cultural Resources, Native American Concerns, and Paleontology	Carl Spath

Table 17. List of BLM Interdisciplinary Preparers and Reviewers	
<i>Resource Parameter/Area of Responsibility</i>	<i>Responsible IDT Member</i>
CRITICAL ELEMENTS	
Air Quality	Jeff O'Connell
Cultural Resources	Cheryl Harrison
Environmental Justice	Jim Byers
Invasive Non-Native Species	Beth Brenneman
Migratory Birds	Jeff Cook
Native American Religious Concerns	Cheryl Harrison
Special Status Species	Jeff Cook (wildlife), Beth Brenneman (plants)
Wastes, Hazardous or Solid	Marty O'Mara
Water Quality, Surface and Ground	Jeff O'Connell
Wetlands and Riparian Zones	Jeff O'Connell
NON-CRITICAL ELEMENTS	
Access and Transportation	Jim Byers
Geology and Minerals	Karen Conrath
Noise	Jim Byers
Paleontology	Karen Conrath
Range Management	Isaac Pittman
Realty Authorizations	Jim Byers
Recreation	Kay Hopkins
Socio-economics	Brian Hopkins
Soils	Jeff O'Connell
Vegetation	Beth Brenneman
Visual Resources	Kay Hopkins
Wildlife, Aquatic	Jeff Cook
Wildlife, Terrestrial	Jeff Cook

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- Colorado Department of Local Affairs, Division of Local Government
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- 1998 *Parachute/Battlement Mesa Natural Gas Infill Drilling*. Environmental Assessment #CO078-98-087 – Glenwood Springs Field Office.
- 1999a *Glenwood Springs Resource Area Oil and Gas Leasing and Development Record of Decision and Resource Management Plan*. Glenwood Springs Field Office.
- 1999b *Glenwood Springs Resource Area Oil and Gas Leasing and Development Final Supplemental Environmental Impact Statement*. Glenwood Springs Field Office.
- 2000 *Land Health Assessment-Battlement Mesa Area*. Glenwood Springs Field Office.
- 2004 *Draft Roan Plateau Planning Area Resource Management Plan Amendment and Environmental Impact Statement*. Glenwood Springs Field Office.
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U.S. Environmental Protection Agency (USEPA).

- 1974 *Information on Noise Levels Identified as Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. EPA-550/9-74-004, Arlington, VA.
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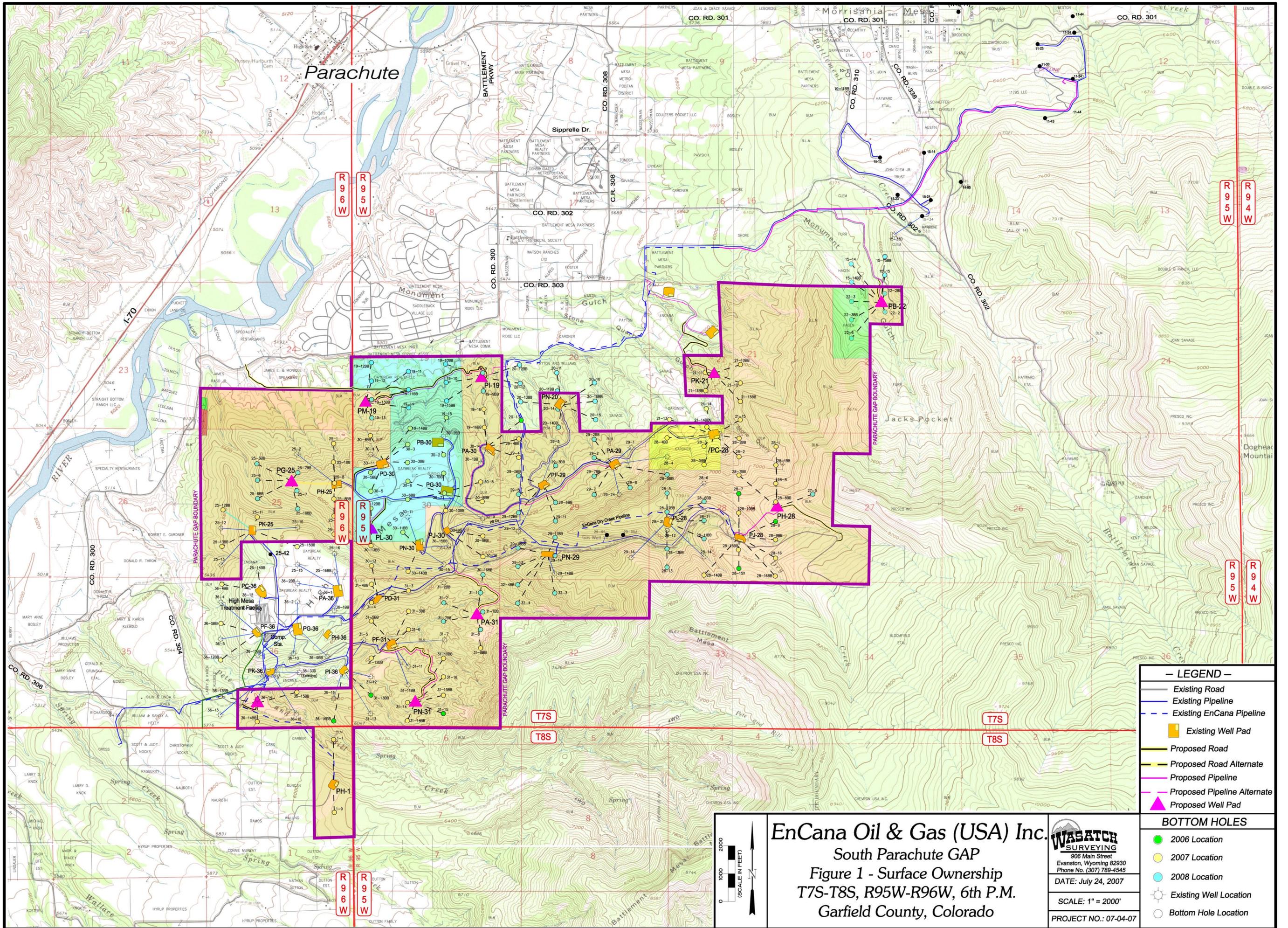
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APPENDIX A

FIGURES

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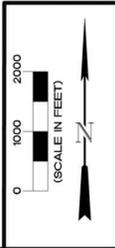


-- LEGEND --

- Existing Road
- Existing Pipeline
- Existing EnCana Pipeline
- Existing Well Pad
- Proposed Road
- Proposed Road Alternate
- Proposed Pipeline
- Proposed Pipeline Alternate
- Proposed Well Pad

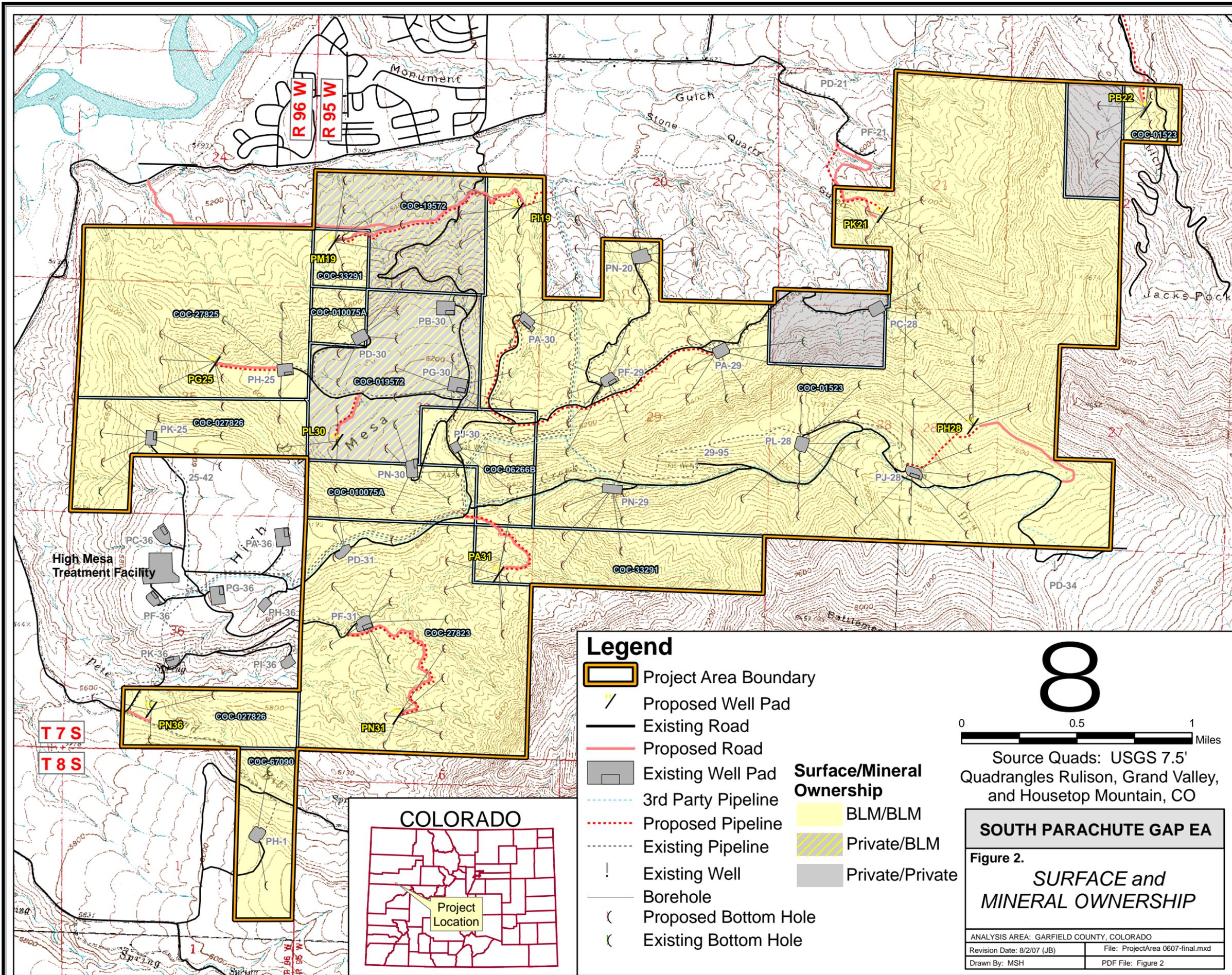
BOTTOM HOLES

- 2006 Location
- 2007 Location
- 2008 Location
- Existing Well Location
- Bottom Hole Location



EnCana Oil & Gas (USA) Inc.
 South Parachute GAP
 Figure 1 - Surface Ownership
 T7S-T8S, R95W-R96W, 6th P.M.
 Garfield County, Colorado

WASATCH SURVEYING
 906 Main Street
 Evanston, Wyoming 82930
 Phone No. (307) 789-4545
 DATE: July 24, 2007
 SCALE: 1" = 2000'
 PROJECT NO.: 07-04-07



Legend

- Project Area Boundary
 - Proposed Well Pad
 - Existing Road
 - Proposed Road
 - Existing Well Pad
 - 3rd Party Pipeline
 - Proposed Pipeline
 - Existing Pipeline
 - Existing Well
 - Borehole
 - Proposed Bottom Hole
 - Existing Bottom Hole
- Surface/Mineral Ownership**
- BLM/BLM
 - Private/BLM
 - Private/Private

8

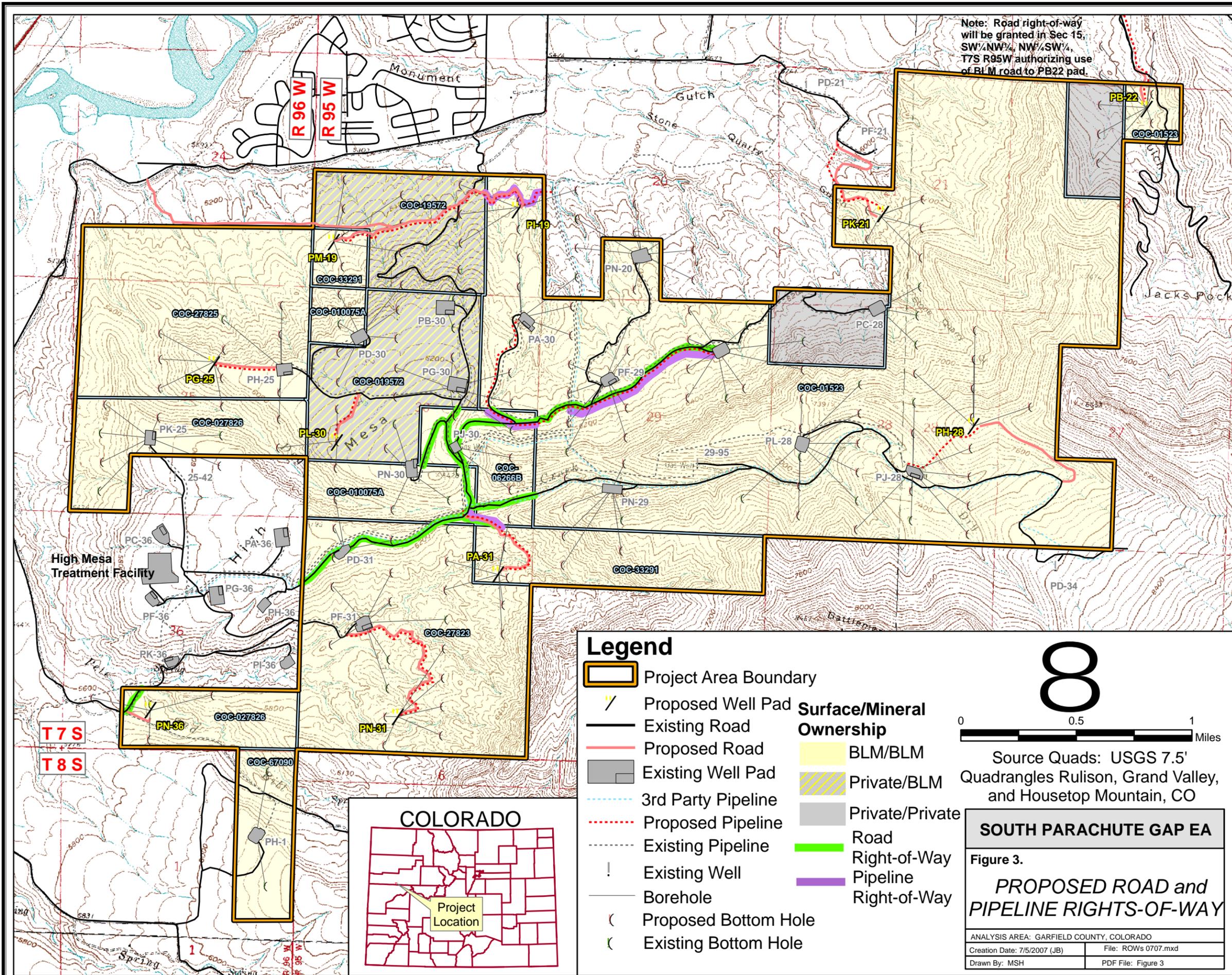
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Source Quads: USGS 7.5' Quadrangles Rulison, Grand Valley, and Husetop Mountain, CO

SOUTH PARACHUTE GAP EA

Figure 2.
SURFACE and MINERAL OWNERSHIP

ANALYSIS AREA: GARFIELD COUNTY, COLORADO
 Revision Date: 8/2/07 (JB) File: ProjectArea 0607-final.mxd
 Drawn By: MSH PDF File: Figure 2



Note: Road right-of-way will be granted in Sec 15, SW/4NW/4, NW/4SW/4, T7S R95W authorizing use of BLM road to PB22 pad.

Legend

- Project Area Boundary
- / Proposed Well Pad
- Existing Road
- Proposed Road
- Existing Well Pad
- 3rd Party Pipeline
- Proposed Pipeline
- Existing Pipeline
- ! Existing Well
- Borehole
- (Proposed Bottom Hole
- (Existing Bottom Hole

- #### Surface/Mineral Ownership
- BLM/BLM
 - Private/BLM
 - Private/Private
 - Road Right-of-Way
 - Pipeline Right-of-Way

8

0 0.5 1 Miles

Source Quads: USGS 7.5' Quadrangles Rulison, Grand Valley, and Housetop Mountain, CO

SOUTH PARACHUTE GAP EA

Figure 3.
PROPOSED ROAD and PIPELINE RIGHTS-OF-WAY

ANALYSIS AREA: GARFIELD COUNTY, COLORADO	
Creation Date: 7/5/2007 (JB)	File: ROWs 0707.mxd
Drawn By: MSH	PDF File: Figure 3

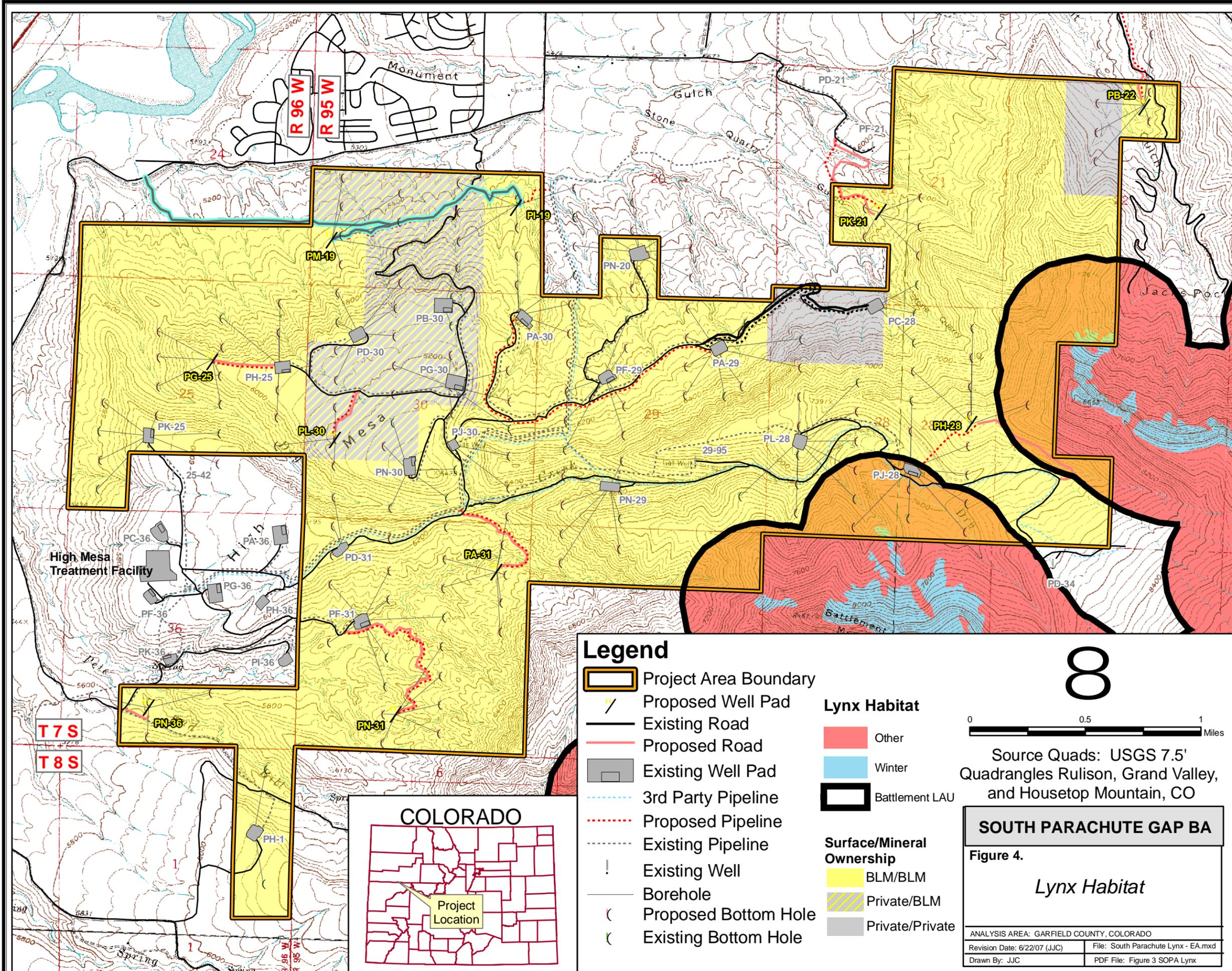


High Mesa Treatment Facility

T 7 S
T 8 S

R 96 W
R 95 W

Note: Road right-of-way will be granted in Sec 15, SW/4NW/4, NW/4SW/4, T7S R95W authorizing use of BLM road to PB22 pad.



Legend

- Project Area Boundary
- Proposed Well Pad
- Existing Road
- Proposed Road
- Existing Well Pad
- 3rd Party Pipeline
- Proposed Pipeline
- Existing Pipeline
- Existing Well
- Borehole
- Proposed Bottom Hole
- Existing Bottom Hole

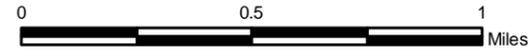
Lynx Habitat

- Other
- Winter
- Battlement LAU

Surface/Mineral Ownership

- BLM/BLM
- Private/BLM
- Private/Private

8



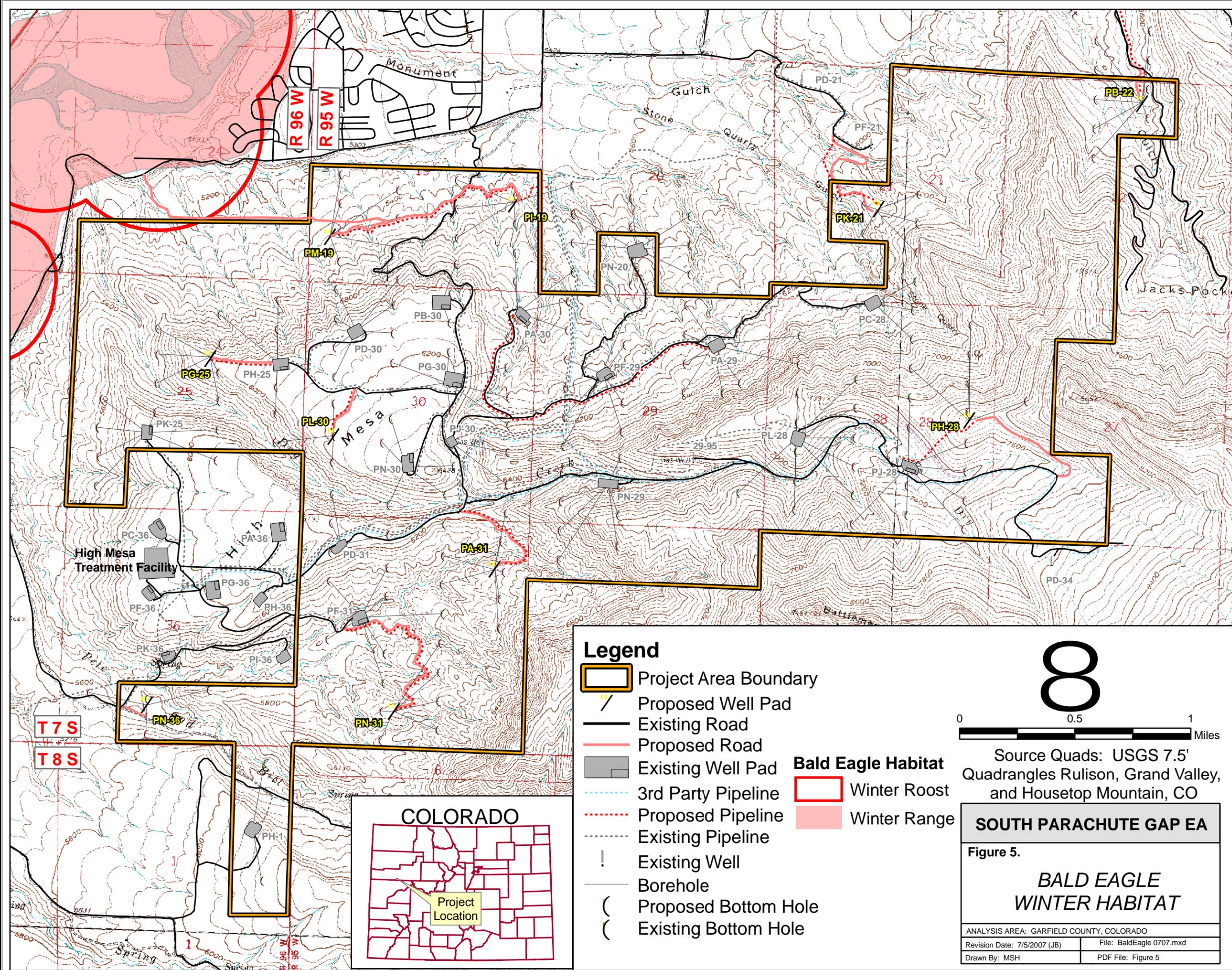
Source Quads: USGS 7.5' Quadrangles Rulison, Grand Valley, and Housetop Mountain, CO

SOUTH PARACHUTE GAP BA

Figure 4.
Lynx Habitat



ANALYSIS AREA: GARFIELD COUNTY, COLORADO	
Revision Date: 6/22/07 (JJC)	File: South Parachute Lynx - EA.mxd
Drawn By: JJC	PDF File: Figure 3 SOPA Lynx



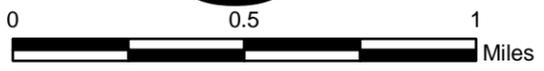
Legend

- Project Area Boundary
- Proposed Well Pad
- Existing Road
- Proposed Road
- Existing Well Pad
- 3rd Party Pipeline
- Proposed Pipeline
- Existing Pipeline
- Existing Well
- Borehole
- Proposed Bottom Hole
- Existing Bottom Hole

Bald Eagle Habitat

- Winter Roost
- Winter Range

8



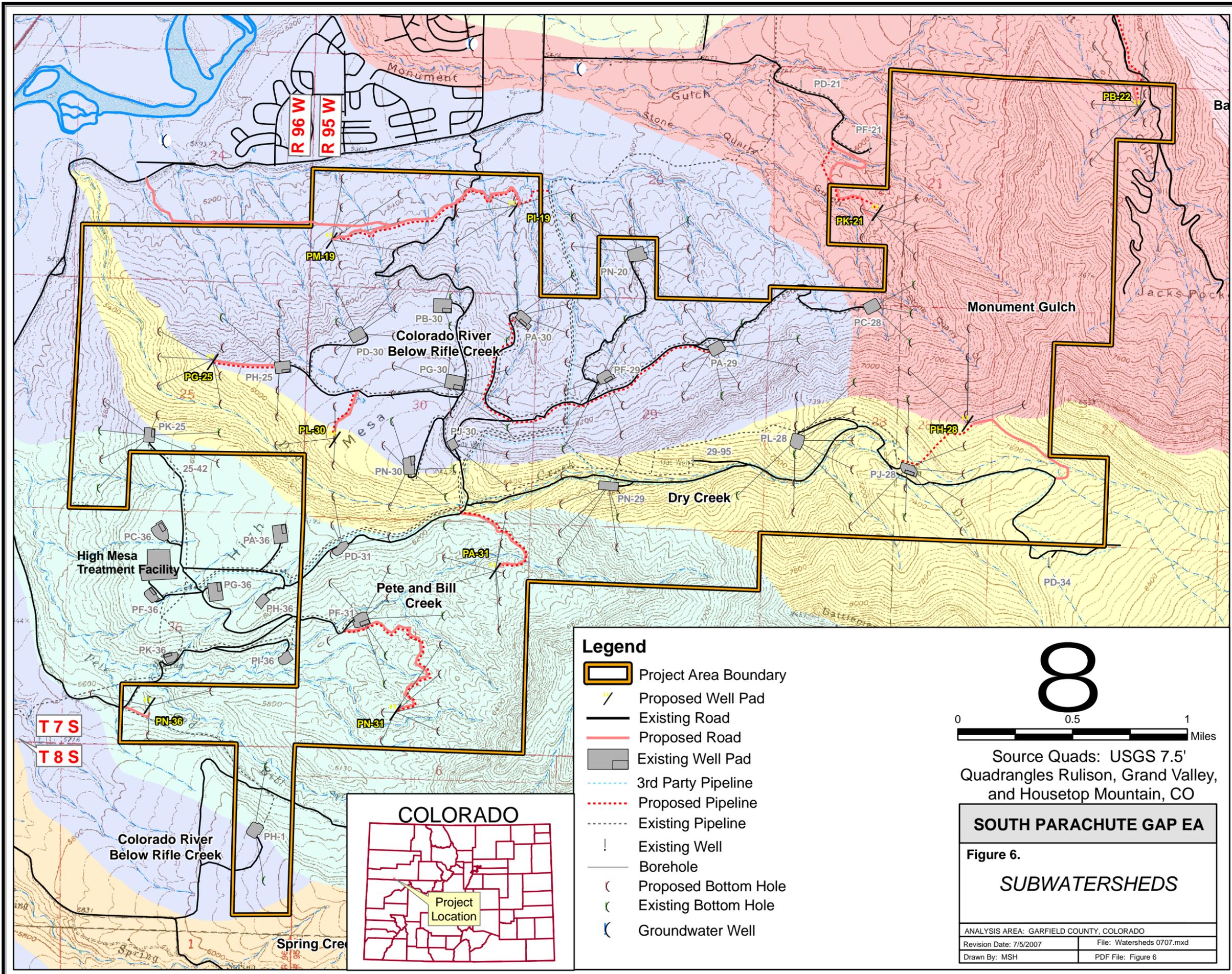
Source Quads: USGS 7.5' Quadrangles Rulison, Grand Valley, and Husetop Mountain, CO

SOUTH PARACHUTE GAP EA

Figure 5.
BALD EAGLE WINTER HABITAT

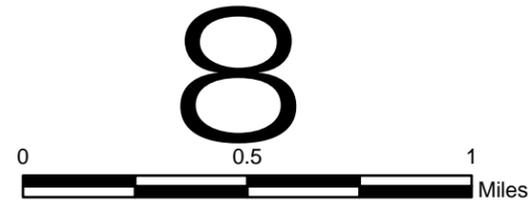
ANALYSIS AREA: GARFIELD COUNTY, COLORADO	
Revision Date: 7/5/2007 (JB)	File: BaldEagle 0707.mxd
Drawn By: MSH	PDF File: Figure 5





Legend

- Project Area Boundary
- Proposed Well Pad
- Existing Road
- Proposed Road
- Existing Well Pad
- 3rd Party Pipeline
- Proposed Pipeline
- Existing Pipeline
- Existing Well
- Borehole
- Proposed Bottom Hole
- Existing Bottom Hole
- Groundwater Well

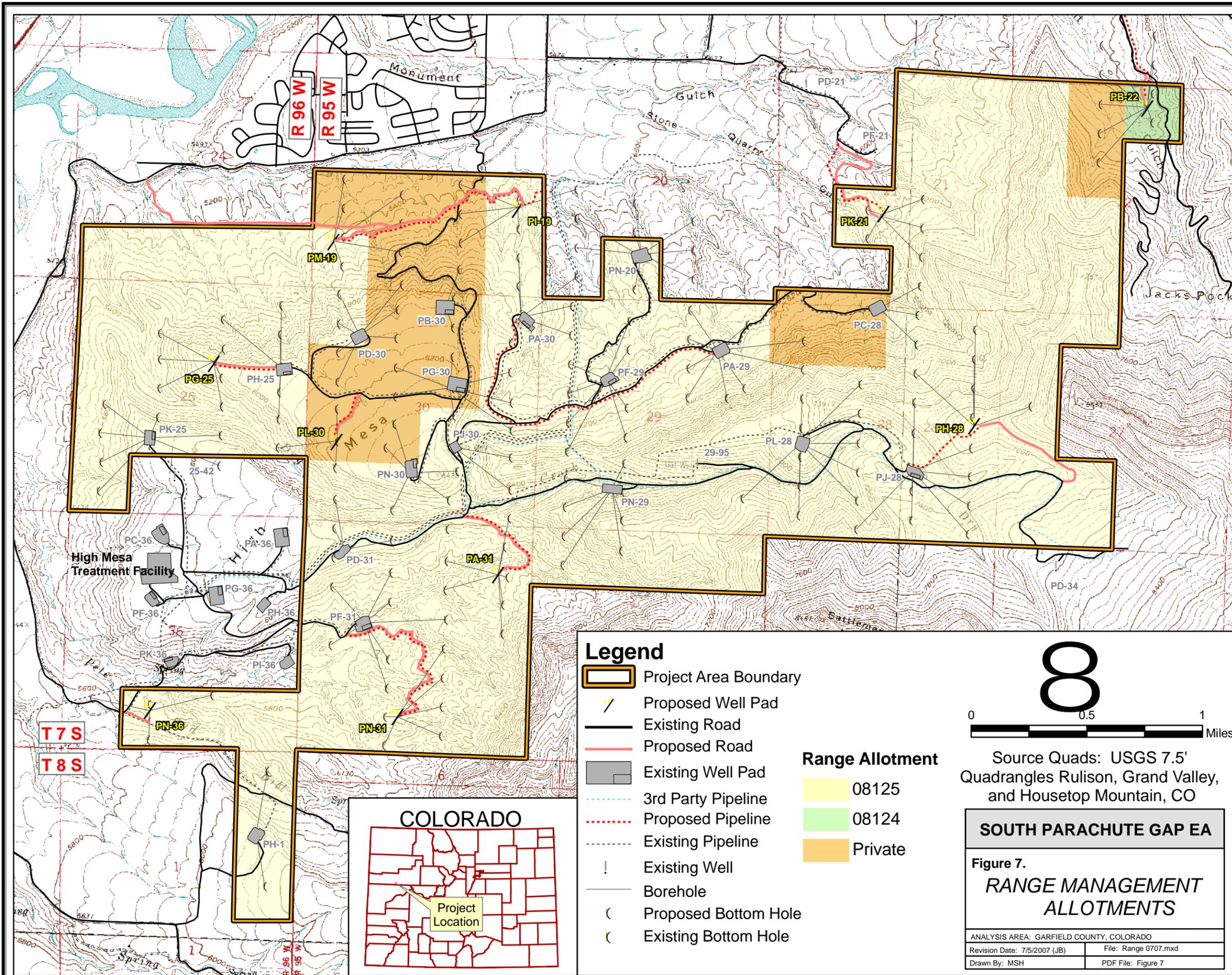


Source Quads: USGS 7.5' Quadrangles Rulison, Grand Valley, and Housetop Mountain, CO

SOUTH PARACHUTE GAP EA

Figure 6.
SUBWATERSHEDS

ANALYSIS AREA: GARFIELD COUNTY, COLORADO	
Revision Date: 7/5/2007	File: Watersheds 0707.mxd
Drawn By: MSH	PDF File: Figure 6



Legend

- Project Area Boundary
- Proposed Well Pad
- Existing Road
- Proposed Road
- Existing Well Pad
- 3rd Party Pipeline
- Proposed Pipeline
- Existing Pipeline
- Existing Well
- Borehole
- Proposed Bottom Hole
- Existing Bottom Hole

Range Allotment

- 08125
- 08124
- Private

8

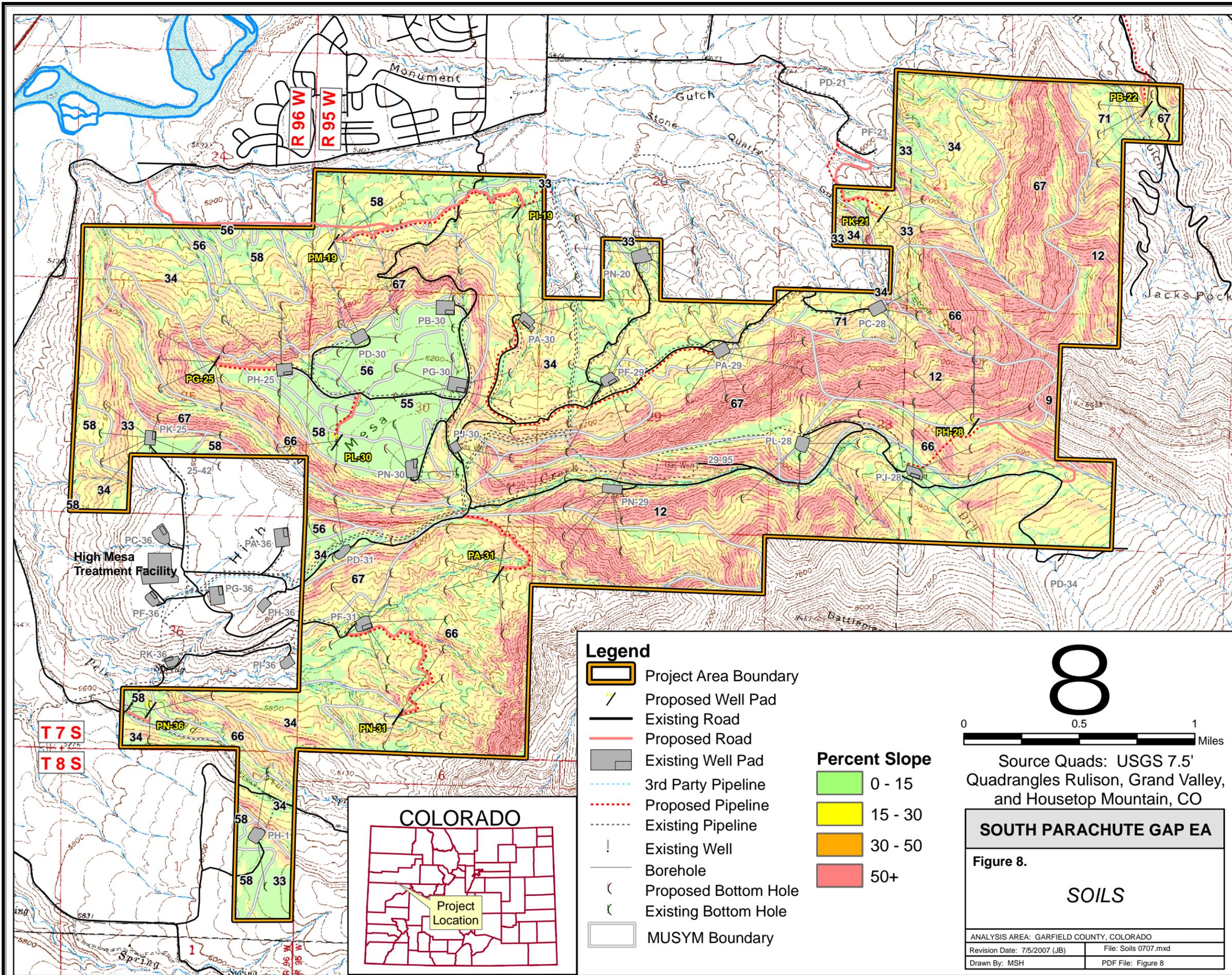
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Source Quads: USGS 7.5' Quadrangles Rulison, Grand Valley, and Husetop Mountain, CO

SOUTH PARACHUTE GAP EA

Figure 7.
RANGE MANAGEMENT ALLOTMENTS

ANALYSIS AREA: GARFIELD COUNTY, COLORADO
 Revision Date: 7/5/2007 (JB) File: Range 0707.mxd
 Drawn By: MSH PDF File: Figure 7



Legend

- Project Area Boundary
- Proposed Well Pad
- Existing Road
- Proposed Road
- Existing Well Pad
- 3rd Party Pipeline
- Proposed Pipeline
- Existing Pipeline
- Existing Well
- Borehole
- Proposed Bottom Hole
- Existing Bottom Hole
- MUSYM Boundary

Percent Slope

- 0 - 15
- 15 - 30
- 30 - 50
- 50+

8

0 0.5 1 Miles

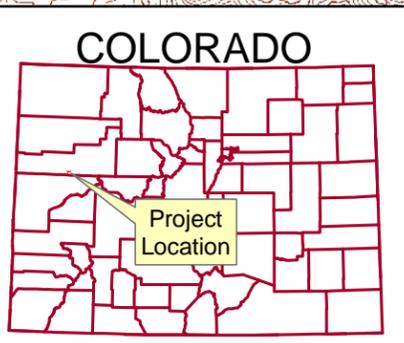
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SOUTH PARACHUTE GAP EA

Figure 8.

SOILS

ANALYSIS AREA: GARFIELD COUNTY, COLORADO
 Revision Date: 7/5/2007 (JB) File: Soils 0707.mxd
 Drawn By: MSH PDF File: Figure 8



High Mesa Treatment Facility

T 7 S

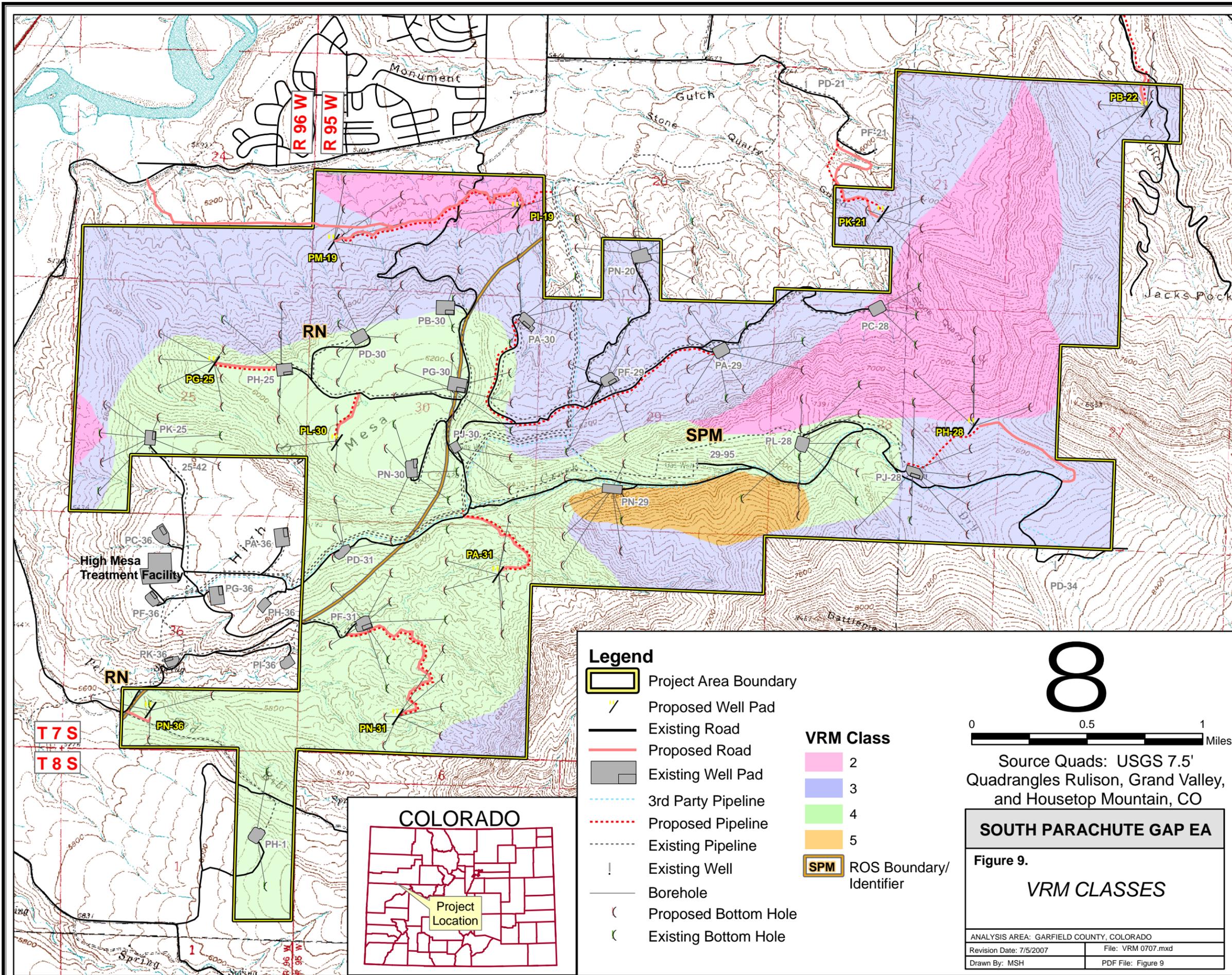
T 8 S

R 96 W

R 95 W

COLORADO

Project Location



Legend

- Project Area Boundary
- Proposed Well Pad
- Existing Road
- Proposed Road
- Existing Well Pad
- 3rd Party Pipeline
- Proposed Pipeline
- Existing Pipeline
- Existing Well
- Borehole
- Proposed Bottom Hole
- Existing Bottom Hole

VRM Class

- 2
- 3
- 4
- 5
- SPM ROS Boundary/Identifier

8

0 0.5 1 Miles

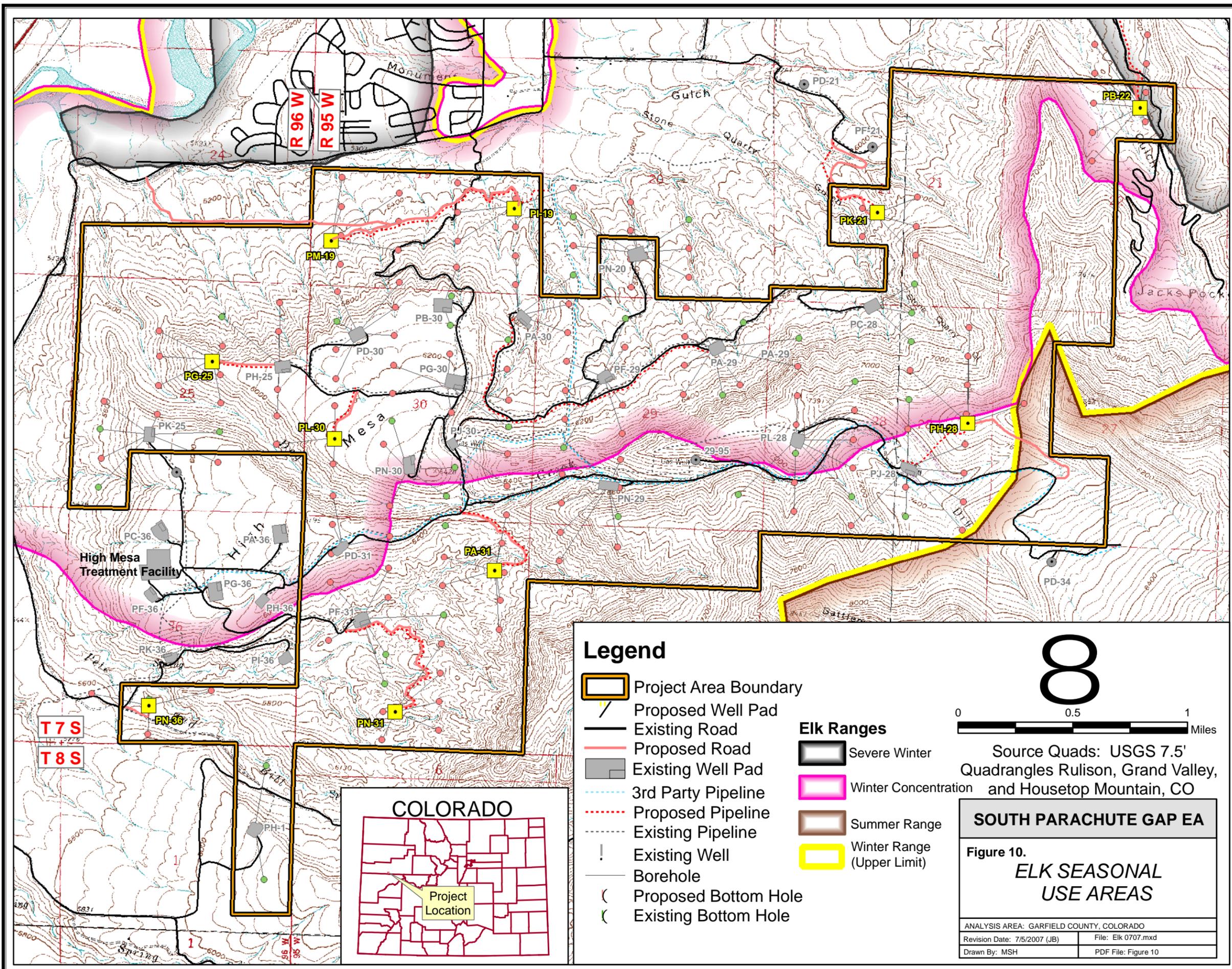
Source Quads: USGS 7.5' Quadrangles Rulison, Grand Valley, and Housetop Mountain, CO

SOUTH PARACHUTE GAP EA

Figure 9.
VRM CLASSES

ANALYSIS AREA: GARFIELD COUNTY, COLORADO	
Revision Date: 7/5/2007	File: VRM 0707.mxd
Drawn By: MSH	PDF File: Figure 9





Legend

- Project Area Boundary
- Proposed Well Pad
- Existing Road
- Proposed Road
- Existing Well Pad
- 3rd Party Pipeline
- Proposed Pipeline
- Existing Pipeline
- Existing Well
- Borehole
- Proposed Bottom Hole
- Existing Bottom Hole

- Elk Ranges**
- Severe Winter
 - Winter Concentration
 - Summer Range
 - Winter Range (Upper Limit)

8

0 0.5 1 Miles

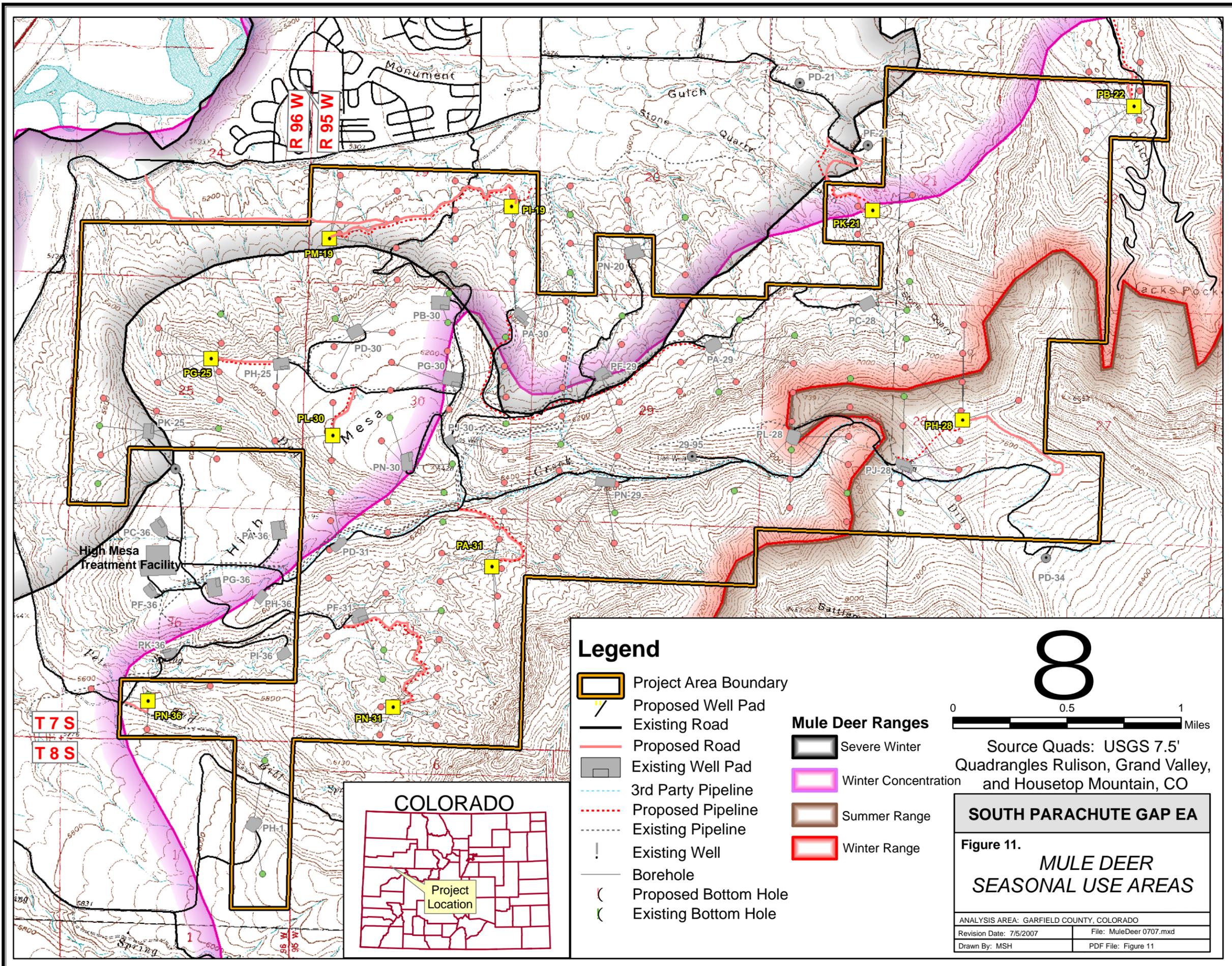
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SOUTH PARACHUTE GAP EA

Figure 10.
ELK SEASONAL USE AREAS

ANALYSIS AREA: GARFIELD COUNTY, COLORADO
 Revision Date: 7/5/2007 (JB) File: Elk 0707.mxd
 Drawn By: MSH PDF File: Figure 10



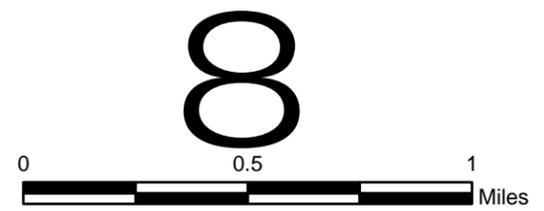


Legend

- Project Area Boundary
- Proposed Well Pad
- Existing Road
- Proposed Road
- Existing Well Pad
- 3rd Party Pipeline
- Proposed Pipeline
- Existing Pipeline
- Existing Well
- Borehole
- Proposed Bottom Hole
- Existing Bottom Hole

Mule Deer Ranges

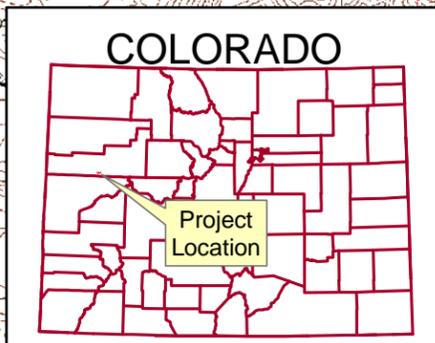
- Severe Winter
- Winter Concentration
- Summer Range
- Winter Range

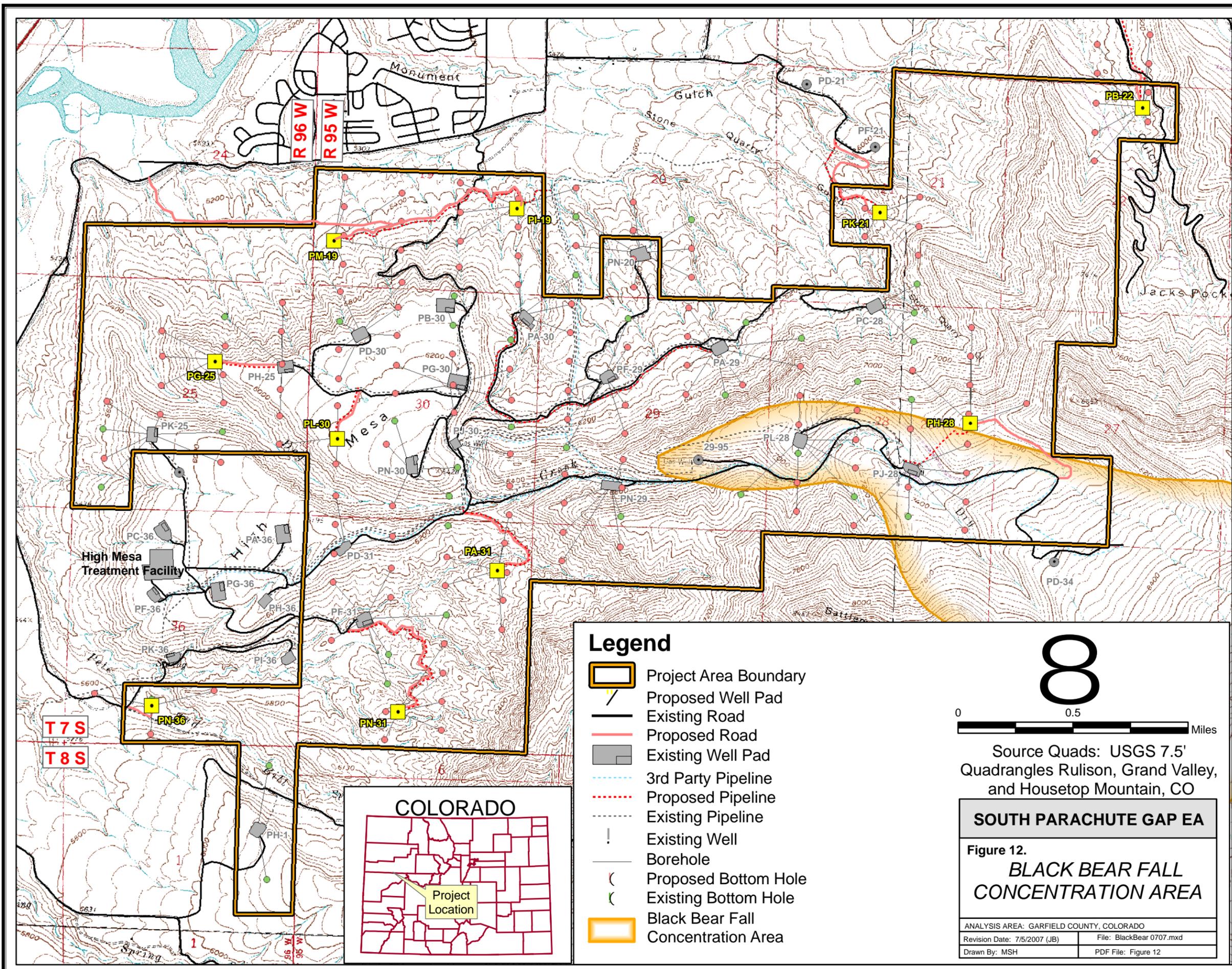


Source Quads: USGS 7.5' Quadrangles Rulison, Grand Valley, and Housetop Mountain, CO

SOUTH PARACHUTE GAP EA
Figure 11.
MULE DEER
SEASONAL USE AREAS

ANALYSIS AREA: GARFIELD COUNTY, COLORADO
 Revision Date: 7/5/2007 File: MuleDeer 0707.mxd
 Drawn By: MSH PDF File: Figure 11





Legend

- Project Area Boundary
- Proposed Well Pad
- Existing Road
- Proposed Road
- Existing Well Pad
- 3rd Party Pipeline
- Proposed Pipeline
- Existing Pipeline
- Existing Well
- Borehole
- Proposed Bottom Hole
- Existing Bottom Hole
- Black Bear Fall Concentration Area

8

0 0.5 Miles

Source Quads: USGS 7.5' Quadrangles Rulison, Grand Valley, and Housetop Mountain, CO

SOUTH PARACHUTE GAP EA

Figure 12.
BLACK BEAR FALL CONCENTRATION AREA

ANALYSIS AREA: GARFIELD COUNTY, COLORADO
 Revision Date: 7/5/2007 (JB) File: BlackBear 0707.mxd
 Drawn By: MSH PDF File: Figure 12

APPENDIX B
PUBLIC COMMENTS

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A Public Notice addressing the SPGAP proposed action was published in the Glenwood Post Independent on February 3, 10, and 17, 2006 and in the Rifle Citizen Telegram on February 2, 9 and 16, 2006. Additionally, a letter containing the public notice information was mailed directly to multiple state and Federal agencies, adjacent landowners, the Battlement Mesa Company, Town of Parachute, Garfield County, and the Colorado Division of Wildlife (CDOW). The 30-day public comment period ended on February 27, 2006.

In response to the solicitation for comment identified in the Public Notice, BLM received comments from the CDOW, the Colorado Mule Deer Association, the Town of Parachute, the Garfield County Board of County Commissioners, and various citizens of Battlement Mesa. The written comments are summarized below.

Colorado Division of Wildlife (CDOW)

In their letter to the BLM, the Colorado Division of Wildlife provided the following comments based on their review of EnCana's GAP proposal, which did not include impact identification or mitigation:

- The operator needs to clearly state that performance based reclamation standards, such as those in the DSEIS (BLM 1999), will be stated and achieved, and the results monitored.

Response: Refer to Vegetation section of EA, and Reclamation Standards identified in Appendix D.

- Without the ability to mitigate and work with operators that own pre-existing leases, the wildlife attributes in the planning area would suffer undue and unnecessary impacts.

Response: Refer to Terrestrial Wildlife section for impact analysis.

- COAs should be applied, in accordance with the 1999 Final Supplemental Environmental Impact Statement (FSEIS) on Oil and Gas Leasing and Development, to mitigate negative impacts to wildlife.

Response: Refer to Terrestrial Wildlife section and Standard Conditions of Approval.

- Travel management should be taken into consideration in the planning of development. Specifically, new roads should be gated to restrict public access and reduce negative impacts to wildlife.

Response: Existing roads serving SPGAP originate on private lands, and in so doing, restrict public access to the Project Area. In many instances, gates controlling access are in place.

- It will be necessary for the BLM to ensure that the stipulations, COAs and mitigation measures described in the FSEIS are not contradicted or diluted by information or statements presented in the EA.

Response: Comment noted.

- In the EA it must clearly state that reseeding will include a 5% shrub component and 10% forb component and monitoring of reseeded areas will ensure success;

Response: Appendix E identifies the seed mix for the SPGAP and reclamation standards. Shrubs comprise 19% of the plant component; forbs are 5% of the plant component.

- Any prescriptions such as CSUs and NSOs have been completely omitted from the document;

Response: Table 3 provides information on lease stipulations and notices applicable to the Proposed Action.

- Well site information needs to be cross-referenced across the various tables and appendices;

Response: Comment noted.

- Stipulations on wildlife timing appear to be shorter than what is normally required;

Response: Wildlife timing limitations are for the standard time period applied by the BLM.

- GAP does not evaluate the development with enough detail to examine the true cumulative impacts

Response: The GAP proposal did not evaluate or quantify impacts as this EA has.

- Within the document, common COAs such as timing restrictions, remote sensing, and restriction of vehicular traffic are not mentioned;

Response: The GAP proposal did not identify COAs applicable to the Proposed Action as this EA has.

- The requirements and standards set forth in the FSEIS have been omitted, selectively applied, or changed in a manner that does not reflect the intent of the FSEIS;

Response: This EA adheres to the requirements and standards set forth in the FSEIS.

- No mention of application of the COA that the FSEIS states would be applied to existing leases to protect wintering big game;

Response: Please refer to mitigation measures identified in Wildlife, Terrestrial section of EA.

- Impacts can not easily be identified without at least acknowledging environmental consequences on surrounding federal lands and thus suggesting what mitigation measure would be applied to offset or minimize conflicts to wildlife and range standards;

Response: Please refer to mitigation measures identified in Wildlife, Terrestrial section of EA.

- Referenced roads are believed to be trails, changing these to roads will have serious impacts on hunting and recreation;

Response: Please refer to Recreation section of EA.

- Concerns with Standards for Public Land Health are not adequately recognized;

Response: Discussions of mitigation and reclamation practices that would be implemented as part of the Proposed Action to facilitate conformance with Public Land Health standards are presented within individual resource sections and Standards for Public Land Health.

- New road construction will negatively impact wildlife through associated human disturbance and habitat degradation;

Response: Please refer to mitigation measures identified in Wildlife, Terrestrial section of EA.

- Pits should be fenced and netted and escape ramps available for wildlife; and

Response: Please refer to mitigation measures identified in Wildlife, Terrestrial section of EA.

- In order for wildlife mitigation to be effective, the components of the GAP need to be woven into a comprehensive and understandable document that can be consistently applied.

Response: Comment noted.

Colorado Mule Deer Association

In their letter to the BLM, the Colorado Mule Deer Association provided the following comments:

- Consolidation of well pads with better use of directional drilling;

Response: A total of 139 wells are proposed from 10 new well pad locations and 16 existing well pads within the SPGAP; see section 1.1.1 – Development (Construction/Drilling/Completion).

- Provide disclosure on the future use of areas within the SPGAP where no wells are currently proposed;

Response: Because of the use of directional drilling, no areas other than those proposed are anticipated to be necessary in the future.

- Allow only one drill rig at any time, but allow for year-round work using this one rig;

Response: Comment noted.

- No moving of the rig to new locations between 1/1 and 4/30 annually; unless it is a mild winter;

Response: Comment noted.

- Construct all pads during the summer months;

Response: Pad construction will occur in accordance with applicable lease stipulations/notices or COAs.

- Reseed all cuts/fills immediately using native species;

Response: Please refer to Vegetation section of EA for vegetation mitigation.

- Revegetation of all existing well pads, if revegetation is not successful within two (2) years then no new pad construction can occur till revegetation is successful;

Response: Comment noted.

- Mandatory use of BMPs;

Response: EnCana and the BLM have standard BMPs that are mandatory for specific actions.

- Control of existing and new noxious weeds within the SPGAP;

Response: Please refer to Invasive, Non-Native species section of EA.

- Stipulations on compliance with the Clean Water Act and the Storm Water Regulation;

Response: Comment noted.

- Adherence to the COGCC 2005 noise levels a stipulation of approval;

Response: Comment noted.

- No use of roads when muddy.

Response: Comment noted.

Town of Parachute – Board of Trustees

- In order to continue to accommodate growth related to the natural gas industry, the local, county and state roads must be considered.

Response: Comment noted

- Traffic problems being created by all growth continue to be an issue.

Response: Comment noted

- The additional industry operations continue to create a problem with mud on the streets within the Town of Parachute, which later becomes dust. The town staff is inundated with calls and complaints regarding mud and dust.

Response: Comment noted. Refer to Standard Conditions of Approval for dust abatement requirements on public land.

- A high level of scrutiny should be given to watersheds, erosion protection, sediment control and timely and strict enforcement of reclamation.

Response: Refer to analysis in Water Quality, Soils and Vegetation sections

Garfield County Board of County Commissioners

In their letter to the BLM (dated March 28, 2006), the Garfield County Board of County Commissioners provided comments that generally revolved around transportation impacts on the county road system. EnCana is currently negotiating an agreement with Garfield County that will address the Commissioners' concerns.

Residents of Battlement Mesa

- When dust is raised south of Stonequarry Road by ATVs and other activities, clouds of dust can roll into the housing units of Saddleback Village, Tamarisk Village, Tamarisk Meadows, the RV Park, Saddleback II, and the elementary school. Many elderly people with lung conditions or breathing problems live in these communities. EnCana must have a serious dust abatement program that is kept on top of on a daily basis.

Response: BLM requires dust abatement measures on public lands. COGCC has regulatory authority on private lands. Garfield County regulates use of County Roads.

- Mud is often present on the paved streets from drilling areas following precipitation events. This creates more dust when the mud dries.

Response: BLM requires dust abatement measures on public lands. COGCC has regulatory authority on private lands. Garfield County regulates use of County Roads.

- Traffic through Battlement Mesa proper should be kept at an absolute minimum.

Response: Garfield County regulates use of county roads.

- Lights from drilling rigs should be shielded.

Response: Comment noted.

- EnCana should implement a noise abatement program.

- **Response:** Comment noted.

- A proposal on speed enforcement and drilling traffic should be included.

Response: Garfield County regulates speed limits on county roads.

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APPENDIX C

13-Point Surface Use Plan

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13-Point Surface Use Plan

1. EXISTING ROADS

- A. The proposed wellsite is staked and reference stakes are present as shown on attached Topo maps.
- B. Access Roads – refer to Topo maps “A” and “B.”
- C. Access Roads within a one-mile radius – refer to Topo map “B.”
- D. The existing roads will be maintained in the same or better condition as existed prior to the commencement of operations and said maintenance will continue until final abandonment and reclamation of the well location. Excessive rutting or other surface disturbance will be avoided. Operations will be suspended temporarily during adverse weather conditions if excessive rutting is occurring when access routes are wet, soft, or partially frozen.

2. PLANNED ACCESS ROAD

All proposed access roads are shown on Topo map “B.”

- A. Width maximum – 30 feet overall right-of-way with an 18-foot road running surface, crowned and ditched and/or sloped and dipped.
- B. Construction standard – the access road will be constructed to the same standards as previously accepted in this area.

The road will be constructed to meet the standards of the anticipated traffic flow and all weather requirements. Construction will include ditching, draining, crowning and capping or sloping and dipping the roadbed as necessary to provide a well-constructed and safe road.

Prior to construction/upgrading the roadway shall be cleared of any snow cover and allowed to dry completely.

Traveling off of the thirty (30) foot right-of-way will not be allowed.

Road drainage crossings shall be of the typical dry creek drainage crossing type. Crossings shall be neither designed so they will not cause siltation or the accumulation of debris in the drainage crossing nor shall the drainages be blocked by the roadbed. Diverting water off at frequent intervals by means of cutouts shall prevent erosion of the drainage ditches by runoff water.

Upgrading shall not be allowed during muddy conditions. Should mud holes develop, they will be filled in and detours around them avoided.

- C. Maximum grade – the average grade will be 10% or less, wherever possible. The 10% grade will only be exceeded in areas where physical terrain or unusual circumstances require it.
- D. Drainage design – the access road will be crowned and ditched or sloped and dipped, and water turnouts installed as necessary to provide proper drainage along the access road route.
- E. Turnouts will be constructed along the access route as necessary or required to allow for the safe passage of traffic.
- F. Culverts – none will be required unless otherwise specified during the onsite inspection.
- G. Surface materials – surfacing materials will consist of native soil. If any additional surfacing materials are required they will be purchased from a local contractor having a permitted source of materials in the area. None are anticipated at this time.
- H. Gates, cattle guards or fence cuts – none required unless specified during the onsite inspection.
- I. Road maintenance – during both the drilling and production phases of operations, the road surface and shoulders will be kept in a safe and legal condition and will be maintained in

accordance with the original construction standards. The access road right-of-way will be kept free of trash during operations.

- J. The proposed access road has been centerline flagged.
- K. Dust will be controlled on the roads and locations during construction and drilling by periodic watering of the roads and locations.

3. LOCATION OF EXISTING WELLS WITHIN A ONE MILE RADIUS

Please refer to Topo Map "C."

4. LOCATION OF EXISTING AND/OR PROPOSED FACILITIES

- A. At each drill location, surface disturbance will be kept to a minimum. Each drill pad will be leveled using cut-and-fill construction techniques as noted in the attached survey.
- B. Should drilling result in established commercial production the following will be shown:
 - 1. Proposed location and attendant lines, by flagging, if off well pad.
 - 2. Dimensions of facilities.
 - 3. Construction methods and materials.
 - 4. Protective measures and devices to protect livestock and wildlife.
 - 5. All buried pipelines will be buried to a depth of 4 feet from ground surface to top of pipe.
 - 6. Construction width of the right-of-way/pipeline route shall be restricted to 60 feet of disturbance.
 - 7. Pipeline location warning signs shall be installed within 90 days after construction is completed.
 - 8. EnCana shall condition pipeline right-of-ways in a manner to preclude vehicular travel upon said rights-of-way, except for access to pipeline drips and valves.
 - 9. Pipeline right-of-way will be requested on the APD for working surface during construction , rehabilitated surface after construction is complete, actual length of pipeline and size of the pipeline for the pad. In the event production is established this well will be tied-in to an existing pipeline as shown in Topo map "D." The area used to contain the proposed production facilities will be built using native materials. If these materials are not acceptable, arrangements will be made to acquire appropriate materials from private sources.
 - 10. A dike will be constructed completely around any production facilities which contain fluids (i.e. production tanks, produced water tanks, etc.) These dikes will be constructed of compacted subsoil, be impervious, hold 110% of the capacity of the largest tank, and be independent of the back cut.
 - 11. All permanent (onsite for six months or longer) above-the-ground constructed or installed, including pumping units, will be painted a flat non-reflective, earthtone color to match one of the standard environmental colors as determined by the five State Rocky Mountain Interagency committee. All production facilities will be painted within six months of installation. Facilities that are required to comply with Occupation Health and Safety Act Rules and Regulations will be excluded from this painting requirement.
 - 12. The production (emergency) pit will be 8 feet in diameter and 8 feet deep. It will be lined with corrugated steel with a steel mesh cover.
 - 13. If different production facilities are required, a sundry notice will be submitted.
- C. EnCana Oil & Gas (USA) Inc. shall protect all survey monuments, witness corners, reference monuments and bearing trees in the affected areas against disturbance during construction, operation, maintenance and termination of the facilities authorized herein.

EnCana Oil & Gas (USA) Inc. shall immediately notify the authorized officer in the event that any corners, monuments or markers are disturbed or are anticipated to be disturbed. If any

monuments, corner or accessories are destroyed, obliterated or damaged during construction, operation or maintenance, EnCana shall secure the services of a Registered Land Surveyor to restore the disturbed monuments, corner or accessories, at the same location, using surveying procedures found in the Manual of surveying Instructions for the Survey of the public Lands of the United States, latest edition. EnCana shall ensure that the Registered Land Surveyor properly records the survey in compliance with the Colorado Revised Statutes 38-53-101 through 38-53-112 (1973) and shall send a copy to the authorized officer.

- D. During drilling and subsequent operations, all equipment and vehicles will be confined to the access road right-of-way and any additional areas as specified in the approved Application for Permit to Drill.
- E. Reclamation of disturbed areas no longer needed for operation will be accomplished by grading, leveling and seeding as recommended by the Bureau of Land Management.

EnCana Oil & Gas (USA) Inc. will be responsible for road maintenance from the beginning to completion of operations.

5. LOCATION AND TYPE OF WATER SUPPLY

- A. Water to be used for the drilling of these wells will be hauled by truck over the roads described in item #1 and item #2, from the nearest water supply. Water volume used in drilling operation is dependent upon the depth of the well and any losses that might occur during drilling.

6. SOURCE OF CONSTRUCTION MATERIALS

- A. All access roads crossing Federal land are described under Item #2, and shown on Map "A." All construction material for these location sites and access roads shall be borrowed material accumulated during the construction of the location sites and access roads. No additional construction material from other sources is anticipated at this time. If in the future it is required, the appropriate actions will be taken to acquire it from private sources.
- B. All trees on the locations, access road, and proposed pipeline routes shall be disposed of by one of the following methods:
 - 1. Trees shall be cut with a maximum stump height of six inches (6") and cut to 4-foot lengths and stacked off location. Trees will not be dozed off the location or access road, except on private surface where trees may be dozed. Trees may also be dozed on pipeline routes and then pulled back onto right-of-way as part of final reclamation.
 - 2. Limbs may be scattered off location, access road or along the pipeline, but not dozed off.

Rootballs shall be buried or placed off location, access road, or pipeline route to be scattered back over the disturbed area as part of the final reclamation.

7. METHODS OF HANDLING WASTE MATERIALS

- A. Cutting will be deposited in the reserve/blooiie pit.
- B. Drilling fluids including salts and chemicals will be contained in the reserve/blooiie pit. Upon termination of drilling and completion operations, the liquid contents of the reserve pit will be removed and disposed of at an approved waste disposal facility within ninety (90) days after termination of drilling and completion activities.

In the event that adverse weather conditions prevent removal of the fluids from the reserve pit within this time period, an extension may be granted by the authorized officer upon receipt of a written request from EnCana Oil & Gas (USA) Inc. The reserve pit will be constructed so as not to leak, break or allow discharge.

- C. Produced fluids – liquid hydrocarbons produced during completion operations will be placed in test tanks on the location. Produced wastewater will be confined to a lined pit (reserve pit) or storage tank for a period not to exceed ninety (90) days after initial production. During the permanent disposal method and location, along with the required water analysis shall be submitted for the authorized officer’s approval. Failure to file an application within the time frame allowed will be considered an incidence of noncompliance.
- D. Sewage- self-contained, chemical toilets will be provided for human waste disposal. Upon completion of operations, or as needed, the toilet holding tanks will be pumped and the contents thereof disposed of in the nearest, approved, sewage disposal facility.
- E. Garbage and other waste material – garbage, trash and other waste materials will be collected in a portable, self-contained and fully – enclosed trash cage during drilling and completion operations. Upon completion of operations (or as needed) the accumulated trash will be disposed of at an authorized sanitary landfill. No trash will be burned on location or placed in the reserve pit.
- F. Immediately after removal of the drilling rig, all debris and other waste materials not contained in the trash cage will be cleaned up and removed from the well location. No adverse materials will be left on the location. Any open pits will be maintained until such time as the pits are backfilled.
- G. The reserve and/or production pit will be constructed on the existing location and will not be located in natural drainages where a flood hazard exists or surface runoff will destroy or damage the pit walls. All pits will be constructed so as not to leak, break, or allow the discharge of liquids there from.
- H. Any spills of oil, gas, salt water or other potentially hazardous substances will be reported immediately to the BLM, and other responsible parties, and will be mitigated immediately, as appropriate, through clean up or removal to an approved disposal site.

8. ANCILLARY FACILITIES

Self-contained travel-type trailers may be used onsite during drilling operations. Standard drilling operation equipment to be on location will include: drilling rig with associated equipment; living facilities for company representative, tool pusher, mud logger, directional driller; toilet facilities and trash containers.

Facilities other than those described in this surface use plan to support drilling operations will be submitted to the authorized officer via a sundry notice (form 3160-5) for approval prior to commencing operations.

WELLSITE LAYOUT

- A. The attached location plat specifies the drill site layout as staked. Cross sections have been drafted to visualize the planned cuts and fills across the location. An average minimum of six (6) inches of topsoil will be stripped from the location (including the areas of cut, fill and/or subsoil storage) and stockpiled for future reclamation of the well site. The stockpiled soil will be seeded within 48 of completion of the pad.
- B. A production schematic showing the proposed production facility layout is attached.
- C. The reserve pit and blooie pit will be constructed as a combination pit capable of holding approximately four times the TD hole volume. The pits were combined, as these are gas wells and there will be no danger of the accumulation of hydrocarbons that could result in a potential safety hazard. The blooie pit might be used for testing, but only after the drilling is completed and the drilling equipment and personnel are off the well site location. In the event that drilling fluid (mud) will have to be used then this pit will also serve as the reserve pit. The reserve pit will be lined to prevent seepage.

This requirement may be waived by the Bureau of Land Management upon receipt of additional information from EnCana Oil & Gas (USA) Inc. concerning the location of fresh water aquifers

and potential flow rates, chemical analyses of waters from the aquifers, and information concerning both the mechanics and nature of the air mist drilling system including any additives used therein.

- D. Prior to the commencement of drilling operations, the reserve pit will be fenced on three (3) sides using three strands of barbed wire according to the following minimum standards:
1. Corner posts shall be cemented and/or braced in such a manner to keep the fence tight at all times.
 2. Standard steel, wood, or pipe posts shall be used between the corner braces. The maximum distance between any two (2) posts shall be no greater than sixteen (16) feet.
 3. All wire shall be stretched using a stretching device before it is attached to the corner posts.

The fourth side of the reserve pit will be fenced immediately upon removal of the drilling rig and the fencing will be maintained until the pit is backfilled.

- E. Any hydrocarbons on the pit will be removed from the pit as soon as possible after drilling operations are completed.
- F. Operator will notify the authorized officer at least three (3) working days prior to construction of the well pad and/or related facilities and within two (2) working days after completion of the well pad.

9. PLANS FOR RECLAMATION OF THE SURFACE:

The BLM will be contacted prior to commencement of any reclamation operations.

A. Production

1. Immediately upon well completion, the well location and surrounding areas(s) will be cleared of all debris, materials, trash and junk not required for production.
2. Immediately upon well completion, any hydrocarbons in the pit shall be removed in accordance with 43CFR 3162.7-1.
3. Before any dirt work to restore the location takes place, the reserve pit will be completely dry and all cans, barrels, pipe, etc. will be removed.

Other waste and spoil materials will be disposed of immediately upon completion of drilling and workover activities.

4. The reserve pit and that portion of the location and access road not needed for production facility/operations will be reclaimed within ninety (90) days from the date of well completion, weather permitting.
5. If the well is a producer, EnCana will upgrade and maintain access roads as necessary to prevent soil erosion, and accommodate year round traffic. Areas unnecessary to operations will have areas reshaped. Topsoil will be redistributed and disked. All areas outside the work area will be re-seeded according to the Bureau of Land Management recommendations for seed mixture.
6. If the well is abandoned or a dry hole, EnCana will restore the access road and location to approximately the original contours. During reclamation of the site, fill material will be pushed into cuts and up over the backslope. No depressions will be left that will trap water or form ponds. Topsoil will be distributed evenly over the location and seeded according to the recommended seed mixture. The access road and location shall be ripped or disked prior to seeding. Perennial vegetation must be established. Additional work shall be required in case of seeding failures, etc.

Seedbed will be prepared by disking then roller packing following the natural contours. Seed will be drilled on contours at a depth no greater than one-half inch (1/2). In areas

that cannot be drilled, seed will be broadcast at double the seeding rate and harrowed into soil. Certified seed will be used whenever available.

Fall seeding will be completed after September 1, and prior to prolonged ground frost. To be effective, spring seeding will be completed after the frost has left the ground and prior to May 15th.

7. Upon completion of backfilling, leveling and recontouring, the stockpiled topsoil will be evenly spread over the reclaimed areas(s). Prior to reseeding, all disturbed surfaces will be scarified and left with a rough surface. No depressions will be left that would trap water and form ponds. All disturbed surfaces will be re-seeded with a seed mixture to be recommended by the BLM.

Seed will be drilled on the contour to approximately a depth of one-half (1/2) inch. All seeding will be conducted after September 1 and prior to ground frost. Spring seeding will be done after the frost leaves the ground and no later than May 15th. If the seeding is unsuccessful, EnCana may be required to make subsequent seedings.

B. DRY HOLE/ABANDONED LOCATIONS

- A. On lands administered by the BLM, abandoned well sites, roads or other disturbed areas will be restored to near their original condition.
This procedure will include:
 - a. Re-establishing irrigation systems where applicable,
 - b. Re-establishing soil conditions in irrigated field in such a way as to ensure cultivation and harvesting of crops and,
 - c. Ensuring revegetation of the disturbed areas to the specification of the BLM at the time of abandonment.
- B. All disturbed surfaces will be recontoured to the approximate natural contours and re-seeded according to BLM specifications. Reclamation of the well pad and access road will be performed as soon as practical after final abandonment and reseeding operations will be performed in the fall or spring following completion of reclamation operations.

10. SURFACE OWNERSHIP

Surface ownership may be either Fee or Federal and is noted on the APD.

11. OTHER INFORMATION

- a. A Class III Cultural Resource Inventory of the proposed drill sites, access roads and other facilities on Federal lands will be conducted and a report filed with the appropriate BLM office.
- b. If archaeological, historical or vertebrate fossil materials are discovered during the course of any construction activities, EnCana will suspend all operations that further disturb such materials and immediately contact the appropriate BLM office. Operations in the area of discovery will not resume until written authorization to proceed has been issued by the BLM authorized officer (AO).
- c. EnCana will be fully responsible for the actions of their subcontractors. A copy of the approved APD and Conditions of Approval will be on location during drilling and completion operations.
- d. Any construction activity in the areas shall be done with awareness that many natural gas pipelines are buried. Some are apparent as to location; some have grown over with weeds and brush. It is suggested that the contractor contact the operators in the area to locate all lines before digging.

12. REPRESENTATIVES AND CERTIFICATION

- A. Representative:
RuthAnn Morss
EnCana Oil & Gas (USA) Inc.
370 17th Street, Suite 1700
Denver, CO 80202
(720)-876-5060

All lease and/or unit operations will be conducted in such a manner that full compliance is made with all applicable laws, regulations, Onshore Oil and Gas Orders, the approved Plan of Operations, and any applicable Notice to Lessees.

The operator will be fully responsible for the actions of its subcontractors. A complete copy of the approved Application for Permit to Drill will be furnished to the field representatives to ensure compliance and shall be on location during all construction and drilling operations.

- B. Representative Certification:

I hereby certify that I, or persons under my supervision, have inspected the proposed drill site and access route, and I am familiar with the conditions that currently exist; that the statements made in this plan are, to the best of my knowledge, true and correct and the work associated with the operations proposed herein will be performed by the operator, its contractors, and subcontractors conformity with this plan and the terms and conditions under which is approved. This statement is subject to the provisions of 18 U.S.C. 1001 for the filing of a false statement.



RuthAnn Morss
EnCana Oil & Gas (USA) Inc.
(720) 876-5060
January 20, 2006

STANDARD CONDITIONS OF APPROVAL

Reclamation and Design/Construction:

The surface location will be constructed as presented and modified by the surveyor, EnCana, and BLM representatives during the on-site. Any significant additional alterations to this design will need to be presented to and approved by the authorized officer prior to construction.

In instances when vegetation is removed in order to construct the pad, this cut vegetation, or slash, shall be spread at the toe of the fill slope and across the top of the cut slope in order to control soil erosion and to decrease the visual impact from the vegetation break and straight lines normally created by a surface location.

All disturbed areas not necessary for drilling and producing operations will undergo the following reclamation standards after completing dirtwork and operations. Specifically, if the well is a producer, the surface area of the drill pad not needed for facilities or operations and unused portions of the road will be reclaimed to the standards below. If the well is not a producer and is plugged in, the following standards will also apply to final reclamation.

A. Re-vegetation: The short-term objective of re-vegetation is to establish vegetation for the control of erosion and to help prevent invasion of noxious and undesirable weeds. The long-term objective is to establish a self-perpetuating set of plant associations compatible with and capable of supporting the pre-disturbance land use.

The rate of application of the seed mix listed in the Surface Use Plan is listed in pounds of pure live seed (PLS)/acre. The seed will be certified and there will be no primary or secondary noxious weeds in the seed mixture. The operator shall notify the authorized officer 24 hours prior to seeding and shall provide evidence of certification of the above seed mix to the authorized officer.

All compacted portions of the pad, road, and pipeline route will be ripped to a depth of 18 inches unless in solid rock. Prior to seeding, stockpiled topsoil (stripped surface material) will be spread to a uniform depth that will allow the establishment of desirable vegetation. All unused disturbed areas will be seeded within 24 hours after completing dirt work unless a change is requested by the operator and approved by the authorized officer. If the seed bed has begun to crust over or seal, the seed bed will be prepared by disking or some other mechanical means sufficient to allow penetration of the seed into the soil. In addition, the broadcast seed should be covered by using a harrow, drag bar, or chain.

B. Re-contouring: The unused disturbed areas surrounding the well location and along the road will be re-contoured to blend as nearly possible with the natural topography. Final grading of back-filled and cut slopes will be done to prevent erosion and encourage establishment of vegetation.

These Reclamation COAs are subject to all disturbances including pipelines and roads. If it is determined by the authorized officer that the above reclamation standards are not being met, the operator will be required to submit a plan to correct the problem. Approval of the plan may require special reclamation practices such as mulching, the method and time of planting, the use of different plant species, soil analysis to determine the need for fertilizer, fertilizing, seed-bed preparation, contour furrowing, watering, terracing, water barring, and the replacement of topsoil.

Areas being reclaimed will be fenced to exclude livestock for the first two growing season or until the seeded species have established. The type of fencing will be approved by the authorized officer.

Noxious weeds which may be introduced due to soil disturbance and reclamation will be treated by methods to be approved by the authorized officer. The Pesticide Use Permit shall be on record with the BLM for treatment of noxious weeds.

Reserve pit fluids will be back filled within one year of construction or to the end of the succeeding summer (August 31) to allow for evaporation of fluids, unless an alternative method of disposal is approved. The back filling of the reserve pit will be done in such a manner that the mud and associated solids will be confined to the pit and not squeezed out and incorporated in the surface materials. There will be a minimum of 3 feet of cover (overburden) on the pit. When work is complete, the pit area will support the weight of heavy equipment without sinking.

A minimum of 2 feet of free board will be maintained in the reserve pit, between the maximum fluid level and the top of the berm. These pits will be designed to exclude all surface runoff.

All pits, cellars, rat holes and other bore holes unnecessary for further lease operations, excluding the reserve pit, will be back-filled immediately after the drilling rig is released to conform with surrounding terrain. Pits, cellars and/or boreholes that remain on location must be fenced as specified for the reserve pit.

Compaction and construction of the berms surrounding the tank batteries will be designed to prevent lateral movement of fluids through the utilized materials, prior to storage of fluids. The berms must be constructed to contain at a minimum 110 percent of the storage capacity of the largest tank within the berm. All loading lines will be placed inside the berm.

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APPENDIX D

10-POINT DRILLING PLAN

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10-POINT DRILLING PLAN

All lease and/or unit operations will be conducted in such a manner that full compliance is made with applicable laws, regulations (43CFR3100), Onshore Oil and Gas Orders No. 1 and No. 2 and the approved Plan of Operations. The operator is fully responsible for the actions of its subcontractors. A copy of the Conditions of Approval will be furnished to the field representatives to ensure compliance.

EnCana Oil & Gas (USA) Inc. will be operating under its **Nationwide Bond # RLB0004733.**

1. **ESTIMATED TOPS OF GEOLOGICAL MARKERS (TVD)**

WASATCH	SURFACE
WASATCH MARKER	3000 ft – 4000 ft
OHIO CREEK (TOP Kmv)	5000 ft – 6000 ft
WILLIAMS FORK	5700 ft – 6600 ft
TOP GAS (PAY)	6700 ft – 7600 ft
COAL RIDGE (PAY)	7900 ft – 8850 ft
ROLLINS	8650 ft – 9600 ft
TD	8750 ft – 9700 ft

Formation and depths will be submitted with the site specific APD.

2. **ESTIMATED TOPS OF POSSIBLE WATER, OIL, GAS OR MINERALS**

The estimated depths at which possible water, oil, gas or minerals will be encountered are as follows:

<u>Substance</u>	<u>Formation</u>	<u>Depth (TVD)</u>
Gas	Top Gas (pay)	6700 ft – 7600 ft TVD
Gas	Coal Ridge (pay)	7900 ft – 8850 ft TVD
Gas/Water	Rollins	8650 ft – 9600 ft TVD

The proposed casing and cementing program has been designed to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. Any isolating medium other than cement shall receive approval prior to use.

The surface casing shall be cemented back to surface either during the primary cement job or by remedial cementing.

3. **OPERATOR'S SPECIFICATIONS FOR PRESSURE CONTROL EQUIPMENT**

- a. Minimum working pressure on rams and BOPE will be 3,000 psi.
- b. Function test and visual inspection of the BOP will be conducted daily and noted in the IADC Daily Drilling Report.
- c. Both high and low pressure tests of the BOPE will be conducted.
- d. The Annular BOP will be pressure tested to a minimum of 50% of its rated working pressure.

- e. Blind and Pipe Rams/BOP will be tested to a minimum of 100% of rated working pressure (against a test plug).
- f. Surface casing will be tested from surface to TD (float collar) at 1,000 psi surface pressure (prior to drilling out the float collar).
- g. All other casing will be pressure tested to 0.22 psi/ft or 1,500 psi, whichever is greater, but not to exceed 70% of the internal yield.
- h. BOP testing procedures and testing frequency will conform to Onshore Order No. 2.
- i. BOP remote controls shall be located on the rig floor at a location readily accessible to the driller. Master controls shall be on the ground at the accumulator and shall have the capability to function all preventers.
- j. The kill line shall be 2" minimum and contain two kill line valves, one of which shall be a check valve.
- k. The choke line shall be 3" minimum and contain two choke line valves (3" minimum).
- l. The choke and manifold shall contain two adjustable chokes.
- m. Hand wheels shall be installed on all ram preventers.
- n. Safety valves and wrenches (with subs for all drill string connections) shall be available on the rig floor at all times.
- o. Inside BOP or float sub shall also be available on the rig floor at all times.
- p. Upper kelly cock valve (with handle) shall be available at all times.

Proposed BOP and Choke Manifold arrangements are attached.

4. **PROPOSED CASING AND CEMENTING PROGRAM**

SUMMARY: The following casing design will consider the deepest reasonable drilling scenario in the GAP region. After GAP approval, a simple one page document summarizing all pertinent well information will be included for each drilling permit application. An example "One Page" document is attached.

Surface Casing and Cement Design:

The following surface casing and cementing design is set up for "minimum case scenario." The lightest casing weight/grade will be used for this master drilling plan.

Due to current oilfield cement supply shortages in the US, the cement program for the surface casing will reflect a suitable, "lighter" single slurry (13.5 ppg TXI). If supply conditions ease, a "more desirable," heavier single slurry (15.8 ppg Class G) will be used when possible.

Production Casing and Cement Design:

The proposed casing and cementing program has been designed to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. Any isolating medium other than cement shall receive approval prior to use.

***Cementing Volume Design Clarification:**

Surface Casing @ 1500 feet:

*Single slurry cement designed to cover the entire section with 100% excess.

Production Casing

*Designed to 200' above top of Mesaverde formation. Volume assumes 7-7/8" gauge hole diameter plus 30%.

*If open hole logs are run, cement volumes will be determined from the caliper plus 10% excess.

Casing	Depth	Hole Size	Size	Weight	Grade	Cement Volume
Conductor	0-40'	+/- 24"	16"	0.25" Wall	X42	+/- 5 yds ready mix (to surface)
Surface	Surface to 1500'	12 1/4"	8 5/8"	32#	J-55, STC All New	± 990 sks TXI 13.5 ppg 1.26 ft ³ /sx
Production Design	0' to 4000' 4000' to 9700'	7-7/8"	4 1/2"	11.6# 11.6#	P-110, LTC I-80, LTC All New	Lead: ± 300 sx TXI 12.0 ppg 1.79 ft ³ /sx Tail: ± 500 sks TXI 13.5 ppg 1.26 ft ³ /sx

Casing Design Considerations/Safety Factors:

A. Surface casing @ 1500' TVD; 8-5/8" 32# J-55 STC

Purpose: Protect shallow fresh water and contain MASP to TD

Maximum anticipated mud weight at surface casing depth: = 9.0 ppg

Maximum anticipated mud weight at TD: = 11.0 ppg

Maximum anticipated equivalent formation pressure at TD = 10.0 ppg

Casing String				Casing Strength Properties			Minimum Design Factors		
Size	Weight (lb/ft)	Grade	Connection	Collapse (psi)	Burst (psi)	Tensile (1000 lb)	Collapse	Burst	Tension
8-5/8"	32	J/K-55	STC	2530	3930	372	1.00	1.10	1.40

Collapse Design:

Evacuated 8-5/8" 32# J-55 casing with 9.0 ppg drilling fluid density.:

Load = $9.0 \times 0.052 \times 1500'$ = 702 psig

Rating = = 2530

S.F. = **3.6**

Burst Design: Assume kick with partially evacuated hole and an influx gradient of 0.22 psi/ft.

8-5/8" 32# J-55

MASP (Load) = $9700' \times (0.52 - 0.22)$ psi/ft = 2910 psig Rating:

= 3930 psig

S.F. = 1.3

Tensile Design: Designed on Air Weight * Buoyancy + overpull margin

8-5/8" 32# J-55

Rating: = 372,000 lbs

Load: $1500' \times 32# \times 0.862 + 100,000$ lbs (OPM) = 141,399 lbs

S.F.

= 2.6

B. Production Casing @ 9700' TVD: 4-1/2" 11.6# P-110/I-80, LTC

Maximum Anticipated Mud Weight at Total Depth = 11.0 ppg
Maximum Anticipated Equivalent Formation Pressure at Total Depth = 10.0 ppg
Maximum Surface Treating Pressure for Fracturing Operations = 7500 psig
Assumed Gas Gradient for Production Operations = 0.115 psi/ft

Casing String				Casing Strength Properties			Minimum Design Factors		
Size	Weight (lb/ft)	Grade	Connection	Collapse (psi)	Burst (psi)	Tensile (1000 lb)	Collapse	Burst	Tension
4-1/2"	11.6	P-110	LTC	7580	10690	279	1.00	1.10	1.40
4-1/2"	11.6	I-80	LTC	6350	7780	201	1.00	1.10	1.20

Collapse Design: Designed on evacuated casing properties with 11.0 ppg drilling fluid density with no internal back-up.

Design Point #1: 4-1/2" 11.6# P-110 from 0' to 4000'

Load = $11.0 \times 0.052 \times 4000'$ = 2288 psig

Rating = 7580 psig

S.F. = 3.3

Design Point #2: 4-1/2" 11.6# I-80 from 4000' to 9700' (TD)

Load = $11.0 \times .052 \times 9700$ = 5548 psig

Rating = 6350 psig

S.F. = 1.1

Burst Design: Assume maximum surface shut-in pressure during production, and maximum surface treating pressure during fracture stimulation operations.

Design Consideration #1: Maximum Surface Shut-In Pressure

Design Point #1: 4-1/2" 11.6# P-110 from 0' to 4000'

MASSIP (Load) = $9700' \times (0.52 - 0.115) \text{psi/ft}$ = 3928 psig

Rating = 10690 psig

S.F. = 2.7

Design Point #2: 4-1/2" 11.6# I-80 from 4000' to 9700' (TD)

Load @ 4000': $9700' \times .52 - (9700 - 4000) \times 0.115$ = 4388 psig

Rating = 7780 psig

S.F. = 1.7

Design Consideration #2: Maximum Surface Treating Pressure During Frac Operations

Design Point #1: 4-1/2" 11.6# P-110 from 0' to 4000'

MATP: = 7500 psig

Rating: = 10690 psig

S.F. = 1.4

Design Point #2: 4-1/2" 11.6# I-80 4000' – 9700' (TD)

Load: Frac grad – FW frac fluid:

$(0.75 - 0.433) \text{psi/ft} \times 9700'$ = 3074 psig

Rating: = 7780 psig

S.F. = 2.5

Tensile Design: Designed on Air Weight * Buoyancy + overpull margin

Design Point #1: 4-1/2" 11.6# P-110 LTC at surface
 Load = (9700' * 11.6 lb/ft * 0.832) + 100,000 lbs (OPM) = 193,616 lbs
 Rating = 279,000 lbs
S.F. = 1.4

Design Point #2: 4-1/2" 11.6# I-80 LTC @ 4000'
 Load = (9700' - 4000') 11.6 * 0.832 + 100,000 lbs (OPM) = 155,011 lbs
 Rating = 201,000 lbs
S.F. = 1.2

6. DIRECTIONAL DRILLING PROGRAM

If the well is vertical, it will be stated as such, or implied by the Surface Hole Location (SHL) and Bottom Hole Location (BHL) location having the same legal footage calls. Otherwise, language will be included to describe the basic well design, footage calls for the SHL, BHL, section, township, range for SHL and BHL, respectively.

Example (Directional Well):

The proposed directional program for this wellbore is attached. An "S" shape directional design will be used to reach a target bottom hole location of 660' FNL and 660' FEL of Sec 16 T7S R94W. Directional plans are attached.

7. PROPOSED DRILLING FLUIDS PROGRAM

Depth	Mud Type	Density lbs/gal	Viscosity (sec/qt)	Fluid Loss (cc)
Surface - BSC	Fresh Water Gel	8.4 - 9.0	28 - 35	NC
BSC - TD	LSND	8.8 - 11.0	35 - 45	5 - 15 cc

Mud flow and volume will be monitored both visually and with electronic pit volume totalizers.

8. TESTING, CORING, AND LOGGING

- a. Drill Stem Testing – None anticipated
- b. Coring – As dictated by geology
- c. Mud Logging – Optional
- d. Logging – See Below:

Open Hole	<u>Logging Interval</u>
PEX	AIT-GR-Neutron/Litho-Density
(Optional-at operators' discretion)	From TD to surface casing.

Cased Hole

CBL/CCL/GR/VDL
RST

As needed for perforating control
In lieu of PEX.

Logging Statement: It is the operator's intent to run one open hole log per pad drilled on both surface and production holes, unless the hole conditions warrant otherwise. In such cases of unstable hole conditions, Operator will seek a waiver on open hole logging from the BLM authorized office.

9. ABNORMAL PRESSURES OR TEMPERATURES; POTENTIAL HAZARDS

This area is known to be underpressured. Lost circulation has been experienced in offset wells. Barite and a selection of "sized" lost circulation materials will be kept on location during drilling operations.

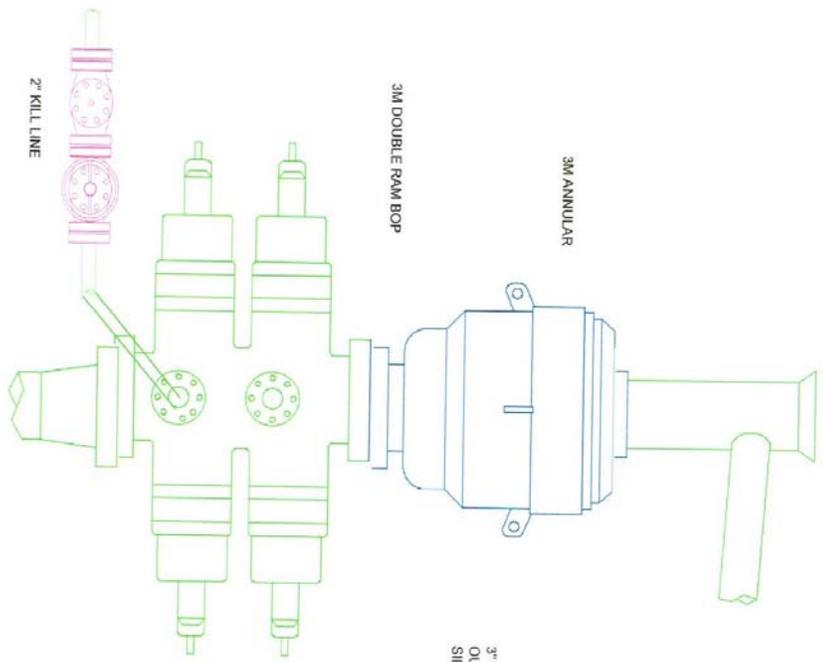
The maximum anticipated bottom hole pressure is $9700' * 0.52 \text{ psi/ft} = 5044 \text{ psi}$

The maximum anticipated surface pressure is $9700' * (0.54 - 0.22) \text{ psi/ft} = 2910 \text{ psi}$

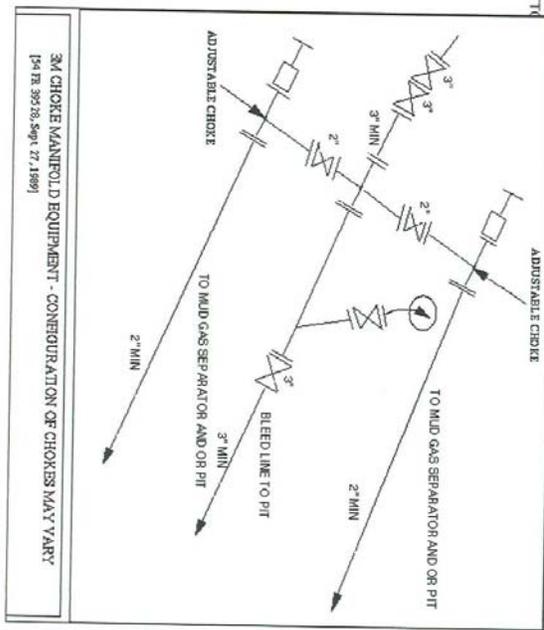
10. ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS

Surface and bottomhole location ownership will be specified. Unless otherwise dictated or surface location necessitates, the locations will be constructed with a standard open pit system.

The drilling operation is anticipated to require ± 19 days on each well. Completion operations are anticipated to begin within 15 days of finishing the drilling portion of the last well drilled on the pad. Completion operations require approximately 30 days.



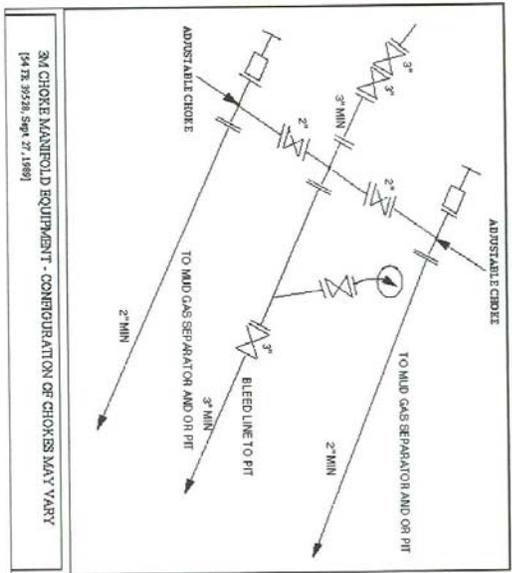
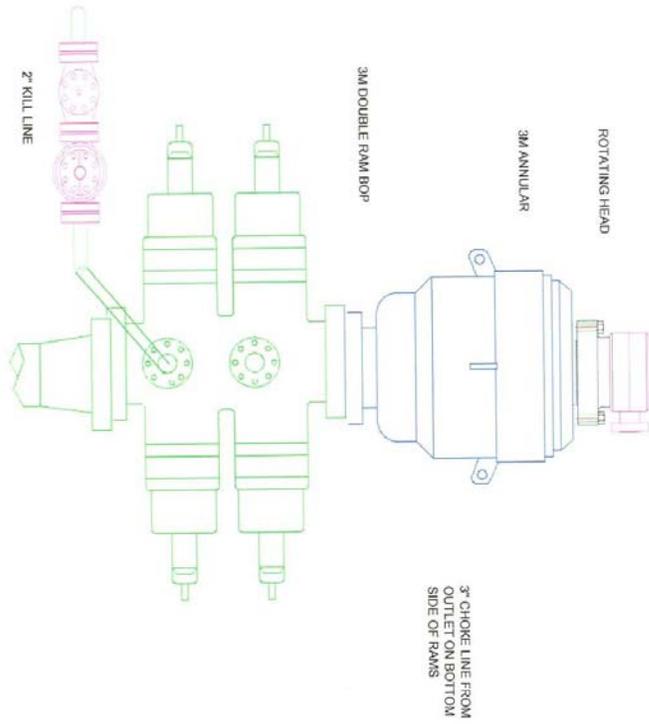
3" CHOKE LINE FROM
OUTLET ON BOTTOM
SIDE OF RAMS



ATTACHMENT A

3M BOP 48

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3M BOP w/ Rot Headers

ATTACHMENT B

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APPENDIX E

**STANDARD CONDITIONS OF APPROVAL AND REGULATORY
REMINDERS**

Standard Conditions of Approval (COAs)

1. Administrative Notification:

At least 48 hours prior to construction, the operator shall notify the BLM representative of construction startup plans.

2. Air Quality:

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. Dust control is needed to prevent heavy plumes of dust from road use that create safety problems and disperses heavy amounts of particulate matter on adjacent vegetation.

Speed control measures on all project-related unpaved roads would also be implemented to reduce vehicle fugitive dust.

3. Cultural Resource/Native American:

Class III cultural resource inventories will be required on any and all new wells, access roads, pipelines and other ground disturbing activities not covered in this plan that require a federal permit or authorization to conduct the action. Additional action specific mitigation may be required – including but not limited to moving the location, archeological monitoring, testing, or data recovery

Strict adherence to the confidentiality of information concerning the nature and location of archaeological resources will be required of Operator and their subcontractors (Archaeological Resource Protection Act 16 U.S.C. 470hh).

The Native American Graves Protection and Repatriation Act (NAGPRA), requires that if inadvertent discovery of Native American Remains or Objects occurs, activity must cease in the area of discovery, a reasonable effort made to protect the item(s) discovered, and immediate notice made to the BLM authorized officer, as well as the appropriate Native American group(s) (IV.C.2). Notice may be followed by a 30-day delay (NAGPRA Section 3(d)).

Colorado State Statutes (CRS 24-80-401 and CRS 24-80-1301) for Historic, Prehistoric, and Archaeological Resources, and for Unmarked Human Graves will have to be adhered to by Operator and their subcontractors on private lands. These State statutes require that the federal Authorizing Officer be notified immediately of any historic or prehistoric finds or human grave. The find must be protected until the Authorizing Officer indicates that the action may proceed.

4. Cultural Resource Education/Discovery:

All persons in the area who are associated with this project must 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 CFR10.4 (g), the BLM authorized officer must 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 43CFR10.4 (c) and (d), activities must stop in the vicinity of the discovery and the discovery must be protected for 30 days or until notified to proceed by the authorized officer.

If in connection with operations under this contract the project proponent, its contractors, subcontractors, or the employees of any of them, discovers, encounters, or becomes aware of any objects or sites of cultural or paleontological value or scientific interest such as historic or prehistoric ruins, graves or grave markers, fossils, or artifacts, the proponent shall immediately suspend all operations in the vicinity of the cultural or paleontological resource and shall notify the BLM authorized officer of the findings (16 U.S.C. 470h-3, 36CFR800.112). Operations may resume at the discovery site upon receipt of written instructions and authorization by the authorized officer. Approval to proceed will be based upon evaluation of the resource. Evaluation shall be by a qualified professional selected by the authorized officer from a federal agency insofar as practicable. When not practicable, the holder shall bear the cost of the services of a non-federal professional.

Within five working days the authorized officer will inform the holder as to:

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

The proponent may relocate activities to avoid the expense of mitigation and/or the 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 proponent will be responsible for mitigation costs. The authorized officer will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the authorized officer that the required mitigation has been completed, the proponent will then be allowed to resume construction.

Antiquities, historic, prehistoric ruins, or objects of scientific interest that are outside the authorization boundaries but directly associated with the impacted resource will also be included in this evaluation and/or mitigation.

Antiquities, historic, prehistoric ruins, or objects of scientific interest, identified or unidentified, that are outside the authorization and not associated with the resource within the authorization will also be protected. Impacts that occur to such resources, which are related to the authorizations activities, will be mitigated at the proponent's cost including Native American consultation cost.

In situations where federal action is required for wells directionally drilled into federal minerals from fee surface overlying fee minerals, BLM's responsibilities under Section 106 of the National Historic Preservation Act [(NHPA) 16 U.S.C. 470] as amended and Section 36 CFR 800.4 will be followed.

5. Invasive Non-Native Species:

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. Contact Beth Brenneman, Glenwood Springs Energy Office Ecologist, at 970-947-5232 or beth_brenneman@blm.gov.

6. Migratory Birds and Raptors:

To protect nesting raptors, a survey shall be conducted prior to construction and drilling activities that are to be initiated during the raptor nesting season (February 1 to August 15). The survey shall include all potential nesting habitat within 0.25 mile of proposed well pads and 0.125 mile of any access roads,

pipeline, or other surface facilities. Results of the survey shall be submitted to the BLM. Contact Jeff Cook, Glenwood Springs Energy Office Wildlife Biologist, at 970-947-5231 or jeffrey_cook@blm.gov. If a raptor nest is located within the buffer widths specified above, a 60-day Timing Limitation (TL) shall be applied to prohibit initiation of construction and drilling activities *[subject to site-specific adjustment by BLM based on factors such as visual screening and the type, timing, and duration of the proposed action]*. The dates of this TL will be based on the particular species of raptor.

It shall be the responsibility of the operator to comply with the Migratory Bird Treaty Act with respect to “take” of migratory bird species. “Take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The operator shall implement measures to prevent use by migratory birds of reserve pits, produced water pits, and evaporation pits that store or are expected to store fluids which may pose a risk to such birds (e.g., migratory waterfowl, shorebirds, wading birds, and raptors) during completion and after completion activities have ceased. Several established methods to prevent bird access are known to be effective. Methods may include but are not limited to netting, the use of bird-balls, or other alternative methods that effectively prevent bird access/use. Regardless of the method used, it should be applied within 24 hours after completion activities have begun. All mortality or injury to species protected by the Migratory Bird Treaty Act shall be reported immediately to the BLM project lead.

7. **Reclamation**. Reclamation 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). The specific measures described below shall be followed during interim reclamation of disturbed surfaces associated with well pads, access roads, and pipelines. These measures, except seedbed preparation, shall also apply to temporary reclamation of topsoil storage piles and surfaces that are subject to interim reclamation but not scheduled to undergo interim reclamation for more than 1 year.

- a. **Seedbed Preparation**. For interim reclamation, all slopes shall be reshaped prior to seedbed preparation. Initial seedbed preparation shall consist of backfilling, leveling, and ripping all areas to be seeded to a minimum depth of 18 inches with a furrow spacing of 2 feet, followed by recontouring the surface and then spreading the stockpiled topsoil evenly. Prior to seeding, the seedbed shall be scarified and left with a rough surface. No depressions shall be left that would trap water and form ponds. Final seedbed preparation shall consist of contour cultivating to a depth of 4 to 6 inches within 24 hours prior to seeding. NOTE: Seedbed preparation is not required for topsoil storage piles or other areas of temporary reclamation.

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

- b. **Seed Mixes**. Selection of seed to be used in temporary or interim reclamation shall comply with the menu-based seed mixes in the letter provided to oil and gas operators dated April 16, 2007. For private surfaces, the menu-based seed mixes are recommended, but the landowner would have ultimate authority over the seed mix to be used in reclamation. The seed shall be certified free of noxious weeds. 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 percent 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.
- c. **Seeding Procedures**. Seeding shall be conducted no more than 24 hours following completion of final seedbed preparation. 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 April 16, 2007).

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

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

- d. 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 reclamation regardless of seeding method.

NOTE: As an exception to this provision, mulch is not required in areas where erosion potential mandates use of a biodegradable erosion-control blanket (straw matting).

- e. 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.
- f. 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% of the new plants are producing seed. The authorized officer will approve the type of fencing.
- g. 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.

Contact Beth Brenneman, Glenwood Springs Energy Office Ecologist, at 970-947-5232 or beth_brenneman@blm.gov.

Operator will be allowed to construct well pad to the maximum expected pad size necessary to drill and complete the number of wells proposed for this location. If, after 1 year from spudding the initial well, or 1 year after spudding any successive well(s), the operator will be required to implement and complete standard interim reclamation practices as identified under Reclamation section in these surface Conditions of Approval OR submit proposed best management practices to be approved by the authorized officer that would be implemented on the "open" pad to control storm water drainage, weed control, wildlife protection measures, dust abatement plan and/or visual resource management.

8. Water Quality, Surface and Ground:

Operator will implement aggressive reclamation and revegetation of disturbed areas not needed for operational activities. In addition operator will implement multiple BMPs including the following: New access roads will be crowned and ditched to allow water to flow off the road surface to reduce volume and velocity. Relief ditches will be installed at regular intervals to direct drainage off of the road grade and into vegetated areas, where it would infiltrate into the ground and/or sediment would settle out on the surface.

Ditches will be allowed to vegetate and/or will include large rocks or stones to slow the velocity of drainage and allow sediment to settle out. Where drainage ditches are installed to direct runoff away from the road on steeper grades, water bars or hay bale dikes will be installed nearly perpendicular to the flow direction of the ditch to reduce runoff velocity and settle out. Operator's road construction plans will identify specific locations of drainage features and BMPs for approval by the BLM prior to construction.

Any shallow groundwater zones encountered during drilling of the proposed wells would be properly protected and the presence of these zones reported to the BLM and COGCC. All usable water zones encountered (those with TDS less than 10,000 mg/L) must be isolated and protected, whether they are shallow or deep. Isolation of shallow zones would be accomplished by setting and cementing surface casing from a depth of at least 50 feet below the deepest water zone to the ground surface. Deeper water-bearing zones would be cemented off as required in the Master APD. For these zones, cementing would be used from 50 feet above to 50 feet below each water-bearing zone.

After the completion of drilling operations, the producing formation would be logged and production casing run and cemented in accordance with the drilling program approved in the APD.

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.

In accordance with Operator's standard policy, all reserve pits will utilize impermeable liners to contain drilling fluids. Following completion activities, pit liners would be removed at the respective landowner's request. At the discretion of Operator and in cooperation with the respective landowner, closed-loop drilling systems may be used on well pads within 100 feet of intermittent drainages.

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. All vehicles would be refueled at least 100 feet from stream channels.

In accordance with Operator's standard policy, erosion protection and silt retention techniques including construction of silt catchment dams, installation of culverts or drainage dips, placement of surface rock on approaches to stream crossings, placement of surface rock, straw bales, and/or matting will be used along proposed road reaches within 100-feet of stream channels.

Within areas less than 100 feet from intermittent drainages, an adequate vegetative buffer, artificial buffers (e.g., straw bales, matting, etc.), or filter strip will be maintained between the road and the drainage to filter runoff from the road before it reaches the creek, wherever possible.

9. Groundwater / Soils / Riparian:

All roads in the SPGAP will be crowned and ditched to allow water to flow off the road surface to reduce volume and velocity as per current BLM Gold Book standards.

As per BLM Gold Book Standards, gravel or other surfacing is required for steep grades, highly erosive soils, clay soils, and/or where all-weather access is needed.

Relief ditches or corrugated metal pipes will be installed at regular intervals as per current BLM Gold Book standards (25 year 6 hour and 24 hour storm events) to direct drainage off of the road grade and into vegetated areas, where it would infiltrate into the ground and sediment would settle out on the surface.

Culverts at drainage crossings shall be installed during no-flow or low-flow conditions and shall be designed and installed to pass a 25-year or greater storm event. On perennial 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 Jeff O'Connell, Glenwood Springs Energy Office Hydrologist at 970-947-5215 or jeffrey_o'connell@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.

All culverts that have currently failed or culverts not aligned in the natural drainage of the channel will be replaced and aligned with the natural channel of the drainage with a gradient that maintains the natural drainage velocity to decrease sedimentation and erosion. Destroyed, damaged or inoperable culverts will be removed from the SPGAP area and disposed of by Operator.

Culverts will be inspected annually to ensure they are functioning properly and promptly maintained (e.g. remove any debris causing blockage) and/or replaced when necessary.

Ditches will be allowed to vegetate and/or would include large rocks or stones to slow the velocity of drainage and allow sediment to settle out.

Where drainage ditches are installed to direct runoff away from the road on steeper grades, water bars or hay bale dikes will be installed nearly perpendicular to the flow direction of the ditch to reduce runoff velocity and settle out particulates as per current BLM Gold Book standards.

Operator's road construction plans will identify specific locations of drainage features and proposed BMPs for approval by the BLM prior to construction.

After the completion of drilling operations, the producing formation will be logged and production casing run and cemented in accordance with the drilling program approved in the APD.

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.

For pipelines installed beneath stream crossings, the operator shall bury the pipeline at a minimum depth of 4 feet below 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.

Construction activities at perennial stream crossings (e.g. burying pipelines, installing culverts) shall occur during low-flow conditions (i.e. late summer/early fall) and shall consist of either a piped stream diversion or the use of a coffer dam and pump to divert flow around the disturbed area.

Operator will implement aggressive reclamation and revegetation of disturbed areas not needed for operational activities. These measures will help prevent erosion and sedimentation to drainages.

Any shallow groundwater zones encountered during drilling of the proposed wells would be properly protected and the presence of these zones reported to the BLM and COGCC.

In order to isolate the Mesa Verde -Wasatch contact, production casing on Federal wells will have a cement top a minimum of 200 feet above the top of Mesa Verde formation.

In accordance with Operator's standard policy, all pits will utilize impermeable liners to contain drilling fluids. Following completion activities, pit liners would be removed at the respective landowner's request.

For pads where a reserve pit is planned, Operator would construct a lined reserve pit to receive the drill cuttings from the wellbore (mainly shale, sand, and miscellaneous rock minerals) and to contain drilling fluids carried over with the cuttings. No hazardous substances would be placed in this pit.

Frac pits to contain water used in completion process will be planned for each new pad location in GAP. Frac pits will also be lined. Compliance with Onshore Order #1 would determine the timing and closure of frac pits. In instances where well drilling would occur in more than 1 drilling season on a pad, the frac pit will be drained dry prior to winter shutdown period or expiration of 90 day period, whichever occurs first. The liner in drained frac pits will be retained until frac pit use is completed.

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 Jeff O'Connell, Glenwood Springs Energy Office Hydrologist, at 970-947-5215 or jeffrey_o'connell@blm.gov.

10. Wastes, Hazardous or Solid:

EnCana and its contractors would be required to collect and properly dispose of any solid wastes generated by this project. Any release (leaks or spills) of hazardous substances in excess of the reportable quantity, as established by 40 CFR, Part 117, would be reported as required by the CERCLA of 1980, as amended. If the release of a hazardous substance in a reportable quantity would occur, a copy of a report would be furnished to the BLM and all other appropriate federal and state agencies. In addition, all releases to soil or water of 10 gallons or more of any substance would be immediately reported verbally to the BLM and COGCC compliance officers and proof of cleanup provided for the project record. This mitigation would be applied at all stages of the project including drilling, completion, operation, and abandonment of the wells.

Protection of sensitive environments in the drilling area would be accomplished through the use of a liner in the reserve pit and the construction or installation of secondary containment facilities. All cuttings, drilling fluids and chemicals are to be contained in the lined pit. Any hydrocarbons in the reserve pit would be removed as soon as possible and processed or disposed of at a permitted offsite facility, and

excess liquids in the reserve pit evaporated. The cuttings would then be buried in place. Backfilling of the pit would be performed in a manner to confine the mud in the pit and avoid incorporating the mud with surface soils.

No chromate additives would be used in the mud system without prior BLM approval. No hazardous substances specifically listed by EPA as a hazardous waste or demonstrating a characteristic of hazardous waste will be used in drilling, testing, or completion operations.

Tank batteries for the storage of produced water and condensate would be placed in secondary containment to prevent migration offsite. These may consist of either corrugated steel surrounds, earthen berms, or both. In the event of an accidental release, produced water and condensate would be confined for clean-up in the containment area and would not migrate to surrounding soils and water.

Under the proposed drilling plan, fuel and lubricants would be temporarily stored in transportable containment trailers or tanks on the proposed well pads. EnCana would implement a Spill Prevention, Control, and Countermeasure (SPCC) Plan to minimize potential impacts from unintentional releases. The SPCC Plan would include accidental discharge reporting procedures, spill response, and cleanup measures. All potentially hazardous materials and substances would be handled in an appropriate manner that minimizes the risk of accidental contamination of soil and water resources.

11. Transportation/ Road Maintenance:

Commuting construction and drilling crews would be encouraged to car pool to reduce the number of vehicle trips on local area roads and associated wear and tear.

All road construction and maintenance activities will adhere to standards identified in the Gold Book.

The operator would encourage commuting construction and drilling crews to comply with posted speed limits on public roads and limit driving speeds to 20 mph on more primitive access roads to reduce the potential for vehicle collisions. By complying with posted speed limit along County Roads, traffic-related noise would also be reduced at nearby residences.

12. Geology:

Mitigation measures for protection of geologic resources are detailed in the Down Hole Standard Conditions of Approval listed in Appendix F. These measures include specific procedures for drilling, cementing, and completing the proposed wells to ensure that gas does not migrate into usable water-bearing zones or contaminate other geologic formations. The SPGAP also describes methods for minimizing the potential for slope instability and erosion, and for interim and final reclamation of disturbed surfaces.

13. Noise:

During drilling and completion, the operator will angle the exhaust muffler stacks on the power units or generators away from private homes. The operator will encourage commuting of construction and drilling crews to mitigate vehicle noise impacts. Operator will use telemetry equipment at all gas well meters to reduce pumper-truck traffic within the SPGAP area.

14. Paleontological Resource Education/Discovery:

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.

As 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.

If significant fossils resources are encountered, construction activities would be halted and the BLM notified of the occurrence immediately. A qualified paleontologist would then visit the site and make site-specific recommendations for impact avoidance. Operations in the area of the discovery would not resume until authorization to proceed has been received from the BLM authorized officer.

15. Range Management:

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.

16. Recreation:

To promote safety for hunters and project workers alike during hunting season, warning signs should be posted along access roads serving active construction and drilling sites to warn hunters of the presence of workers and associated vehicle traffic in the area.

17. Vegetation:

To avoid pinyon tree mortality caused by infestations of the *Ips* beetle, any pinyon trees disturbed during road, pad, or pipeline construction work 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.

18. Visual Resources:

To help mitigate the contrast of bare, recontoured slopes, reclamation will include measures to feather cleared lines of vegetation, and to save and redistribute cleared trees, debris, and rock over reshaped cut-and-fill slopes.

To reduce the view of production facilities from visibility corridors and private residences, facilities will not be placed in visually exposed locations (i.e., they will be located against backdrops or cut side of pad) and will be placed to allow the maximum reshaping of cut-and-fill slopes. Furthermore, all above ground facilities will be painted Shale Green (Munsell 5Y4/2) to blend with the existing landscape.

As a general rule, unless otherwise approved by BLM authorized officer, the production pack(s) and storage tanks(s) will not be set more than 100 feet from the nearest wellhead to satisfy COGCC regulation.

Trees and vegetation would be left along the edges of the pads whenever feasible. Berms may need to be constructed on the fill portion on leading edges of pads with substantial cuts and fills.

19. Wildlife: To protect big game winter habitat use, a 60-day timing limitation shall be applied to activities associated with Federal leases COC06266B, COC 010075A, COC 01523, COC 019572, and

COC 67090. During the January 1 to March 1 period, construction, drilling, and completion activities are prohibited. Operation and maintenance activities are permissible.

This timing limitation is also applicable to all rights-of-ways associated with the SPGAP. The operator shall not use these roads for activities related to construction, drilling, and completion operations during the January 1 to March 1 period.

Remote monitoring shall be conducted during the winter months to minimize site visits to pad locations and reduce traffic impacts to wintering big game wildlife. In addition, scheduled winter visits (those other than for emergency purposes), should be scheduled between 10 a.m. and 3 p.m. to further minimize disturbance to wintering big game wildlife.

REGULATORY REMINDERS

Approval of this application does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease, which would entitle the applicant to conduct operations thereon.

All lease and/or unit operations will be conducted in such a manner that full compliance is made with applicable laws, regulations (43 CFR 3100), Onshore Oil and Gas Orders, and the approved plan of operations. The operator is fully responsible for the actions of his subcontractors.

A copy of the approved application for permit to drill (APD), including the conditions of approval and accompanying surface use plan will be furnished to the field representative by the operator to insure compliance and will be available to authorized personnel at the drill site whenever active construction or drilling operations are underway.

Fire restrictions may be in effect when location is being constructed and/or when well is being drilled. Contact the appropriate Surface Management Agency for information.

A. DRILLING PROGRAM

All operations, unless otherwise specifically approved in the APD, must be conducted in accordance with Onshore Oil and Gas Order No. 2.

1. Estimated Depth at Which Oil, Gas, Water, or Other Mineral Bearing Zones are Expected to be Encountered

Any usable water zones encountered below the surface casing shall be isolated and or protected by cementing across the zone. The minimum requirement is to cement from 50 feet above to 50 feet below each usable water zone encountered.

If gas is found to be present in the Wasatch formation, then the zone will need to be isolated either by the primary cement job or remedial cementing.

2. Pressure Control Equipment

The BOP and related equipment shall meet the minimum requirements of Onshore Oil and Gas Order No. 2 for equipment and testing requirements, procedures, etc., for a 3M system and individual components shall be operable as designed. Chart recorders shall be used for all pressure tests.

3. Casing Program and Auxiliary Equipment

The surface casing **shall** be cemented back to surface either during the primary cement job or by remedial cementing. Leak-off tests of the casing shoe will be performed and recorded for all wells.

4. Mud Program and Circulating Medium

Hazardous substances specifically listed by the EPA as a hazardous waste or demonstrating a characteristic of a hazardous waste will not be used in drilling, testing, or completion operations.

No chromate additives will be used in the mud system on Federal and Indian lands without prior BLM approval to ensure adequate protection of fresh water aquifers.

5. Coring, Logging and Testing Program

Daily drilling and completion progress reports shall be submitted to this office on a weekly basis.

All Drill Stem tests (DST) shall be accomplished during daylight hours, unless specific approval to start during other hours is obtained from the AO. However, DSTs may be allowed to continue at night if the test was initiated during daylight hours and the rate of flow is stabilized and if adequate lighting is available (i.e., lighting which is adequate for visibility and vapor proof for safe operations). Packers can be released, but tripping should not begin before daylight unless prior approval is obtained from the AO.

A cement bond log (CBL) will be run from the production casing shoe to **TOC** and shall be utilized to determine the bond quality for the production casing.

Whether the well is completed as a dry hole or as a producer, "Well Completion and Recompletion Report and Log" (Form 3160-4) will be submitted not later than 30 days after completion of the well or after completion of operations being performed, in accordance with 43 CFR 3164. **One** copy of all logs, core descriptions, core analyses, well-test data, geologic summaries, sample description, and all other surveys or data obtained and compiled during the drilling, workover, and/or completion operations, will be filed with Form 3160-4. Samples (cuttings, fluids, and/or gases) will be submitted when requested by the AO.

6. Notifications of Operations

No location will be constructed or moved, no well will be plugged, and no drilling or workover equipment will be removed from a well to be placed in a suspended status without prior approval of the AO. If operations are to be suspended, prior approval of the AO will be obtained and notification given before resumption of operations.

The Glenwood Springs Energy Office shall be notified, during regular work hours (7:45 a.m.-4:30 p.m., Monday through Friday except holidays), at least 24 hours **prior** to spudding the well.

Operator shall report production data to MMS pursuant to 30 CFR 216.5 using form MMS/3160.

The date on which production is commenced or resumed will be construed for oil wells as the date on which liquid hydrocarbons are first sold or shipped from a temporary storage facility,

such as a test tank, and for which a run ticket is required to be generated or, the date on which liquid hydrocarbons are first produced into a permanent storage facility, whichever first occurs; and, for gas wells as the date on which associated liquid hydrocarbons are first sold or shipped from a temporary storage facility, such as a test tank, and for which a run ticket is required to be generated or, the date on which gas is first measured through permanent metering facilities, whichever first occurs.

Should the well be successfully completed for production, the AO will be notified when the well is placed in a producing status. Such notification will be sent by telegram or other written communication, not later than five (5) days following the date on which the well is placed on production.

A schematic facilities diagram as required by 43 CFR 3162.7-5 (b.9. d.), and shall be submitted to the appropriate District Office within sixty (60) days of installation or first production, whichever occurs first. All site security regulations as specified in Onshore Oil & Gas Order No. 3 shall be adhered to. All product lines entering and leaving hydrocarbon storage tanks will be effectively sealed in accordance with 43 CFR 3162.7-5 (b. 4).

No well abandonment operations will be commenced without the prior approval of the AO. In the case of newly drilled dry holes or failures, and in emergency situations, oral approval will be obtained from the AO. A "Subsequent Report of Abandonment" Form 3160-5, will be filed with the AO within thirty (30) days following completion of the well for abandonment. This report will indicate where plugs were placed and the current status of surface restoration. Final abandonment will not be approved until the surface reclamation work required by the approved APD or approved abandonment notice has been completed to the satisfaction of the AO or his representative, or the appropriate Surface Managing Agency.

7. Other Information

All loading lines will be placed inside the berm surrounding the tank battery.

All off-lease storage, off-lease measurement, or commingling on-lease or off-lease will have prior written approval from the AO.

All open-vent exhaust stacks associated with heater-treater, separator, and dehydrator units must be constructed to prevent birds and bats from entering them and to the extent practical to discourage perching and nesting.

The oil and gas measurement facilities will be installed on the well location. The oil and gas meters will be calibrated in place prior to any deliveries. Tests for meter accuracy will be conducted following initial installation and at least quarterly thereafter. The AO will be provided with a date and time for the initial meter calibration and all future meter-proving schedules. A copy of the meter calibration reports will be submitted to the Grand Junction Field Office. All meter measurement facilities will conform to Onshore Oil & Gas Order No. 4 for liquid hydrocarbons and Onshore Oil & Gas Order No. 5 for natural gas measurement.

The use of materials under BLM jurisdiction will conform to 43 CFR 3610.2-3.

There will be no deviation from the proposed drilling and/or workover program without prior approval from the AO. Safe drilling and operating practices must be observed. All wells, whether drilling, producing, suspended, or abandoned will be identified in accordance with 43 CFR 3162.

"Sundry Notice and Report on Wells" (Form 3160-5) will be filed for approval for all changes of plans and other operations in accordance with 43 CFR 3162.3-2.

Section 102(b)(3) of the Federal Oil and Gas Royalty Management Act of 1982, as implemented by the applicable provisions of the operating regulations at Title 43 CFR 3162.4-1(c), requires that "not later than the 5th business day after any well begins production on which royalty is due anywhere on a lease site or allocated to a lease site, or resumes production in the 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."

If you fail to comply with this requirement in the manner and time allowed, you shall be liable for a civil penalty of up to \$10,000 per violation for each day such violation continues, not to exceed a maximum of 20 days. See Section 109(c)(3) of the Federal Oil and Gas Royalty Management Act of 1982 and the implementing regulations at Title 43 CFR 3162.4-1(b)(5)(ii).

In the event after-hours approval or notification is necessary, please contact one of the following individuals:

Marty O'Mara Petroleum Engineer	Work: 970-947-2825 Cell: 970-319-5837
Steve Ficklin Petroleum Engineering Tech-	Work: 970-947-5213 Cell: 970-319-2509
Jennifer Gallegos Petroleum Engineering Tech-	Work: 970-974-5220 Cell: 970-319-2211
Jim Byers Natural Resource Specialist	Work: 970-947-5222 Cell: 970-319-2532
BLM Fax: 970-947-5267	

APPENDIX F

SITE-SPECIFIC AND DOWNHOLE CONDITIONS OF APPROVAL

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PI19 Well Pad

New Wells: 19-9, 19-9BB, 19-10, 19-10BB, 19-15BB, 20-12,

- 1.** Standard Conditions of Approval outlined in Appendix E of the South Parachute GAP will apply and remain in full force and effect.
- 2.** In order to reduce contrasts, trees should be left standing in the fill slopes along the NW corner. In addition, dark-colored matting will be required to be placed on visible cuts and fills soon after construction.

PM19 Well Pad

New Wells: 19-11, 19-11BB, 19-12, 19-12BB, 19-13, 19-13BB, 19-14,

- 1.** Standard Conditions of Approval outlined in Appendix E of the South Parachute GAP will apply and remain in full force and effect.
- 2.** The modified stipulation for lease # COC33291 for the protection of wildlife habitat with a timing limitation between January 1 and March 1.
- 3.** Surface facilities on pad should be placed at cut side of pad to reduce visibility from I-70 and nearby residential areas. Low profile facilities should be installed where feasible.
- 4.** In order to reduce a high degree of visual contrast from dominating the landscape, dark-colored matting or application of a dark pigment on exposed soils will be required to be placed on cuts and fills that are visible from identified KOPs, after construction activities on both the pad and along the access road.

PK21 Well Pad

New Wells: 21-10, 21-10BB, 21-11, 21-11BB, 21-15BB

1. Standard Conditions of Approval outlined in Appendix E of the South Parachute GAP will apply and remain in full force and effect.
2. Since an active Red-tailed hawk nest is located within 1/4 mile of proposed access road, the area will need to be re-surveyed prior to any construction. If the nest is found to be active, a 60-day timing limitation or relocation of the road up to 200 meters would be applied to a ¼ mile buffer around the nest site to minimize disturbance during a portion of the critical nesting period.
3. In order to reduce contrasts, trees located along the western edge of the proposed pad and adjacent to the excess material pile should be retained.

PB22 Well Pad

New Wells: 15-14, 15-14BB, 15-15, 15-15BB, 22-2, 22-2BB, 22-3, 22-3BB, 22-6

1. Standard Conditions of Approval outlined in Appendix E of the South Parachute GAP will apply and remain in full force and effect.

PH28 Well Pad

New Wells: 27-5, 28-1, 28-1BB, 28-7BB, 28-8, 28-8BB

1. Standard Conditions of Approval outlined in Appendix E of the South Parachute GAP will apply and remain in full force and effect.
2. EnCana will obtain an ACOE permit for the riparian/wetland area that will be affected by the proposed access road.
3. All aspen trees that would be removed for the construction of the proposed access road would be bucked up to 4' lengths and scattered.
4. No disturbance to the conifer trees on the north side of the well pad will occur.
5. All production equipment will be located on the existing PJ28 well pad to the south to minimize winter disturbance, as the pad is in a wildlife seclusion area which has a NSO between December 1 and May 1.

PG25 Well Pad

New Wells: 25-3, 25-6, 25-6BB, 25-7, 25-7BB, 25-10BB

1. Standard Conditions of Approval outlined in Appendix E of the South Parachute GAP will apply and remain in full force and effect.
2. The modified stipulation for lease # COC27825 for the protection of wildlife habitat with a timing limitation between January 1 and March 1.
3. Cultural Mitigation: The “historic properties” that are potentially eligible for listing on the National Register of Historic Places (NRHP) will have to be tested/salvaged to further refine the NRHP eligibility. If the sites retain their historic property status and they can not be avoided by the access road/pipeline and pad, a data recovery (excavation) plan will have to be developed in consultation with the Colorado State Historic Preservation Officer. Adequate completion of this data recovery plan will be required prior to any ground disturbance. Cultural resource monitoring may still be required after testing and data recovery.

PL30 Well Pad

New Wells: 25-9BB, 30-12, 30-12BB, 30-13BB

1. Standard Conditions of Approval outlined in Appendix E of the South Parachute GAP will apply and remain in full force and effect.

PA31 Well Pad

New Wells: 30-16BB, 31-1, 31-1BB, 31-2, 31-7BB, 31-8, 31-8BB

1. Standard Conditions of Approval outlined in Appendix E of the South Parachute GAP will apply and remain in full force and effect.
2. The modified stipulation for lease # COC27826 for the protection of wildlife habitat with a timing limitation between January 1 and March 1.

PN31 Well Pad

New Wells: 31-10, 31-10BB, 31-14, 31-14BB, 31-15, 31-15BB

1. Standard Conditions of Approval outlined in Appendix E of the South Parachute GAP will apply and remain in full force and effect.
2. The modified stipulation for lease # COC27826 for the protection of wildlife habitat with a timing limitation between January 1 and March 1.
3. VRM Class IV objectives would be met with the Standard Conditions of Approval. Color contrasts between dark green of dominant pinyon-juniper with revegetated cut-and-fill slopes for well pad and access road should be minimized by reshaping contours of cut-and-fills to a more natural appearance, and adding texture to the slopes with rock, debris, and vegetation that provides some variety in size, shape and color.

PN36 Well Pad

New Wells: 36-13BB, 36-14BB, 36-15BB

1. Standard Conditions of Approval outlined in Appendix E of the South Parachute GAP will apply and remain in full force and effect.
2. The modified stipulation for lease # COC27826 for the protection of wildlife habitat with a timing limitation between January 1 and March 1.
3. Since an active Cooper's hawk nest is located within 1/4 mile of proposed access road, the area will need to be re-surveyed prior to any construction. If the nest is found to be active, no exploration, drilling or development activity will occur within 1/4 mile of active raptor nest between April 1 and August 31 according to the stipulation for lease #COC27826.

Downhole – Standard Conditions of Approval

NOTIFICATION REQUIREMENTS

- | | |
|---------------------------------|---|
| Location Construction | - At le at 48 hours prior to construction of location and access roads. |
| Spud Notice | - At least 24 hours prior to spudding the well. |
| Casing String and Cementing | - At least 24 hours prior to running casing and cementing all casing strings. |
| BOP and Related Equipment Tests | - At least 24 hours prior to initiating pressure tests. |
| First Production Notice | - Within 5 business days after new well begins, or production resumes after well has been off production for more than 90 days. |
| Reclamation | - At least 24 hours prior to reshaping the well pad. |

For more specific details on notification requirements, please check the Conditions of Approval for Notice to Drill and Surface Use Program.

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