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Bureau of Land Management
Colorado State Office

Colorado River Valley Field Office

May 2012



**Environmental Assessment of the
Pumba Natural Gas Pipeline
DOI-BLM-CO-N040-2012-0035-EA**



**Bureau of Land Management
Colorado River Valley Field Office
2300 River Frontage Road
Silt, Colorado 81652**

**ENVIRONMENTAL ASSESSMENT
DOI-BLM-CO-N040-2012-0035
Pumba Natural Gas Pipeline
Garfield County, Colorado
May 2012**

Lead Agency: USDI Bureau of Land Management
Colorado River Valley Field Office

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EXECUTIVE SUMMARY

Encana Oil & Gas (USA) Inc. (Encana) proposes to construct approximately 11.2 miles of 30-inch-diameter buried steel natural gas pipeline and related above ground facilities in Garfield County, Colorado. The natural gas pipeline would begin at the East Mamm compressor station and traverse Hunter Mesa to the Pumba compressor station. From there, the pipeline would cross the southern end of Grass Mesa and follow the eastern and northern slopes of Flatiron Mesa to Taughenbaugh Mesa. From Taughenbaugh Mesa, the pipeline would be bored using the horizontal directional drilling technique (HDD) under the Colorado River and would terminate at the Rifle compressor station.

Encana has requested a 50-foot-wide permanent right-of-way and an adjacent 25-foot-wide temporary construction area as well as nine extra work spaces (EWSs) to facilitate construction of the pipeline. These EWSs are necessary in areas of challenging terrain and to allow additional room for staging at the bore locations. The pipeline would cross private land as well as Federal land administered by the Bureau of Land Management (BLM) and would require permits and approvals from the BLM, U.S. Army Corps of Engineers, and Garfield County. Because the Pumba Pipeline would cross both private and Federal lands, the portions across BLM lands would require the issuance of a right-of-way grant pursuant to the Mineral Leasing Act. If approved, the grant serial number would be COC75103.

The pipeline would have the capacity to transport approximately 600 million cubic feet per day (MMcfd) of raw natural gas from the East Mamm compressor station to the Rifle compressor station. The pipeline has been sized to accommodate future gas production currently anticipated by Encana and other producers. This capacity would be in addition to the existing Enterprise 36-inch pipeline used to transport gas to the Meeker Gas Plant in Rio Blanco County, Colorado.

The Pumba Pipeline would allow Encana and other natural gas producers the opportunity to transport increased volumes of gas from the Mesaverde formation and from the Niobrara formation in the Mamm Creek Field without having to construct additional treatment and processing facilities. In addition, the Niobrara formation contains lean natural gas (low in heavier natural gas components) that is currently commingled with richer Mesaverde gas in the gathering systems and transported out of the Mamm Creek field in a single pipeline. Eventually, the leaner Niobrara gas would be separated from the richer Mesaverde gas.

Construction would begin upon receipt of the necessary agency approvals and permits, with a desired start date in spring/summer 2012. Construction is anticipated to require approximately 4 to 6 months to complete. Site reclamation would occur after installation of the pipeline and be completed prior to winter 2012. The pipeline would be operated on a year-round basis.

The pipeline would be offset horizontally from existing pipelines and installed at a depth to allow at least 36 inches of soil cover above the pipe. Unimproved roads and dry drainage ditches would be open cut. Crossings of county roads would be bored under the roadway to avoid disrupting traffic, in accordance with BLM requirements and Garfield County permitting agreements. The pipeline would also be bored beneath the Colorado River, with a total bore length of 0.9 mile to avoid disturbing sensitive surface features, including adjacent wetlands.

Following construction, disturbed areas would be returned to preconstruction grades and contours. Topsoil would then be replaced over the right-of-way from the area where it was stripped. Revegetation using one or more native seed mixes approved by the BLM would be the primary method for stabilizing soils, controlling erosion, impeding infestations of noxious weeds, and returning the disturbed areas to a self-sustaining community of desirable native species. On private lands, the landowner would have final say in the selection of seed mix.

FONSI
DOI-BLM-CO-N040-2012-0035-EA

The USDI Bureau of Land Management (BLM), Colorado River Valley Field Office (CRVFO), has reviewed the attached Environmental Assessment (EA) of the Pumba natural gas pipeline project proposed by Encana Oil & Gas (USA) Inc. The project design and approved mitigation measures result in a Finding of No Significant Impact on the human environment for the Proposed Action. Therefore, an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) is not necessary to analyze the impacts further.

DECISION RECORD

DECISION: It is my decision to approve the Proposed Action of the Pumba Natural Gas Pipeline.

RATIONALE:

1. This decision will provide for the orderly, economical, and environmentally sound gathering and conveyance of natural gas resources from valid Federal oil and gas leases.
2. Large portions of the project alignment will follow existing pipeline corridors. Segments where new corridors must be constructed have been located and designed to minimize adverse environmental consequences.
3. This decision does not authorize the initiation of construction activities on BLM lands. Those activities will be authorized only upon issuance by BLM of a right-of-way (ROW) grant for portions of the pipeline on BLM lands.

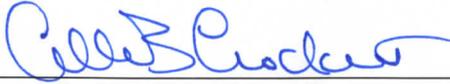
MITIGATION: Environmental impacts will be avoided, minimized, or mitigated by the following:

- Construction of the pipeline along an existing pipeline corridor to the extent practicable.
- Project design components (e.g., boring beneath the Colorado River) to protect water quality for downstream users and special status species, including the Colorado pikeminnow and razorback sucker, two big-river fishes Federally listed as endangered species.
- Reductions in habitat disturbance and implementation of specific mitigation and reclamation practices to minimize impact to Harrington's penstemon, a BLM sensitive plant species.
- Timing limitations to prohibit construction from December 1 through April 30 to protect seasonally critical use by deer and elk of mapped winter range.
- A variety of additional restrictions applied as stipulations attached to the ROW Grant.

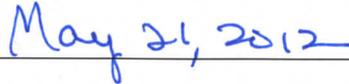
Copies of the Pumba Natural Gas Pipeline EA are available for review at the BLM Colorado River Valley Field Office located at 2300 River Frontage Road in Silt, Colorado 81625.

NAME OF PREPARER: Julie McGrew, Natural Resource Specialist, Project Lead

SIGNATURE OF AUTHORIZED OFFICIAL:



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Date

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1. INTRODUCTION

1.1 Background

Encana Oil & Gas (USA) Inc. (Encana) proposes to construct approximately 11.2 miles of 30-inch diameter buried steel natural gas pipeline and related above-ground facilities. The pipeline would be constructed across private land as well as Federal land administered by the Bureau of Land Management (BLM), with 5.6 miles on each type of surface ownership. Total surface disturbance would be 96.5 acres, of which 49.9 acres would be on Federal land. Issuance by the BLM of a right-of-way grant would be required for portions of the pipeline and other surface-disturbing activities on Federal land. The grant would include a permanent 50-foot right-of-way for the pipeline, an additional 25-foot temporary construction corridor, and nine extra work spaces (EWSs) to facilitate construction of the pipeline. If approved, the right-of-way grant would have serial number COC75103 and would be approved for an initial 30-year term. The temporary use permit for the temporary construction corridor and EWSs would have a term of up to 3 years. The project would be situated entirely within Garfield County, Colorado (Figure 1) and would require permits and approvals from BLM, the U.S. Army Corps of Engineers (USACE), Garfield County, and City of Rifle. Construction would begin upon receipt of agency approvals and permits. Anticipated duration of construction is approximately 6 months. Figure 2 shows the alignment and bore locations. Appendix A describes COAs to be applied to the project.

1.2 Purpose and Need

Drilling, development, and production of natural gas wells in the vicinity of Rifle and Parachute, Colorado, yields a significant volume of natural gas and associated liquid condensate. Existing pipelines would be unable to adequately gather and transport the quantities of natural gas anticipated by Encana in the future, given its plans to increase development in the Mamm Creek area. This project would provide a trunkline for gathering and transporting the projected future volumes of raw natural gas to a downstream pipeline and processing plant. From there, the refined gas would be piped to major regional interconnections with interstate pipelines to supply natural gas throughout the country.

The proposed natural gas pipeline would have the capacity to transport approximately 600 million cubic feet per day (MMcfd) of raw natural gas from the East Mamm compressor station to the Rifle compressor station in Garfield County. The pipeline would not only accommodate Encana's anticipated future needs but provide a mechanism by which other producers in the area could deliver their untreated gas to the existing Enterprise 36-inch pipeline, which transports gas to the Meeker Gas Plant in Rio Blanco County, Colorado. Natural gas liquids (condensates) are currently being transported via existing pipeline from the Meeker Gas Plant to the nearby Mid-America Pipeline Company (MAPCO) pipeline lateral, and the processed natural gas would most likely be delivered to the Rockies Express Pipeline at the White River hub or other interstate pipeline sales outlets.

The Pumba Pipeline would also allow Encana and other producers to transport increased volumes of gas from the Niobrara formation in the Mamm Creek Field without constructing additional treatment and processing facilities. The Niobrara formation contains very lean natural gas, meaning that it is essentially pure methane and contains very little heavier natural gas components such as propane, butane, and gasoline. At the present time, natural gas from both lean Niobrara gas and richer Mesaverde gas are commingled in the gathering systems and transported out of the Mamm Creek field in a single pipeline. Initially, the gas would remain commingled in the gathering system, but eventually the leaner Niobrara gas would be separated from the richer Mesaverde gas. At that time, the existing 24-inch Mamm Creek to Rifle pipeline would continue to move the richer Mesaverde gas out of the Mamm Creek field, and the 30-inch Pumba Pipeline would move the leaner Niobrara gas out of the field as a segregated gas stream.

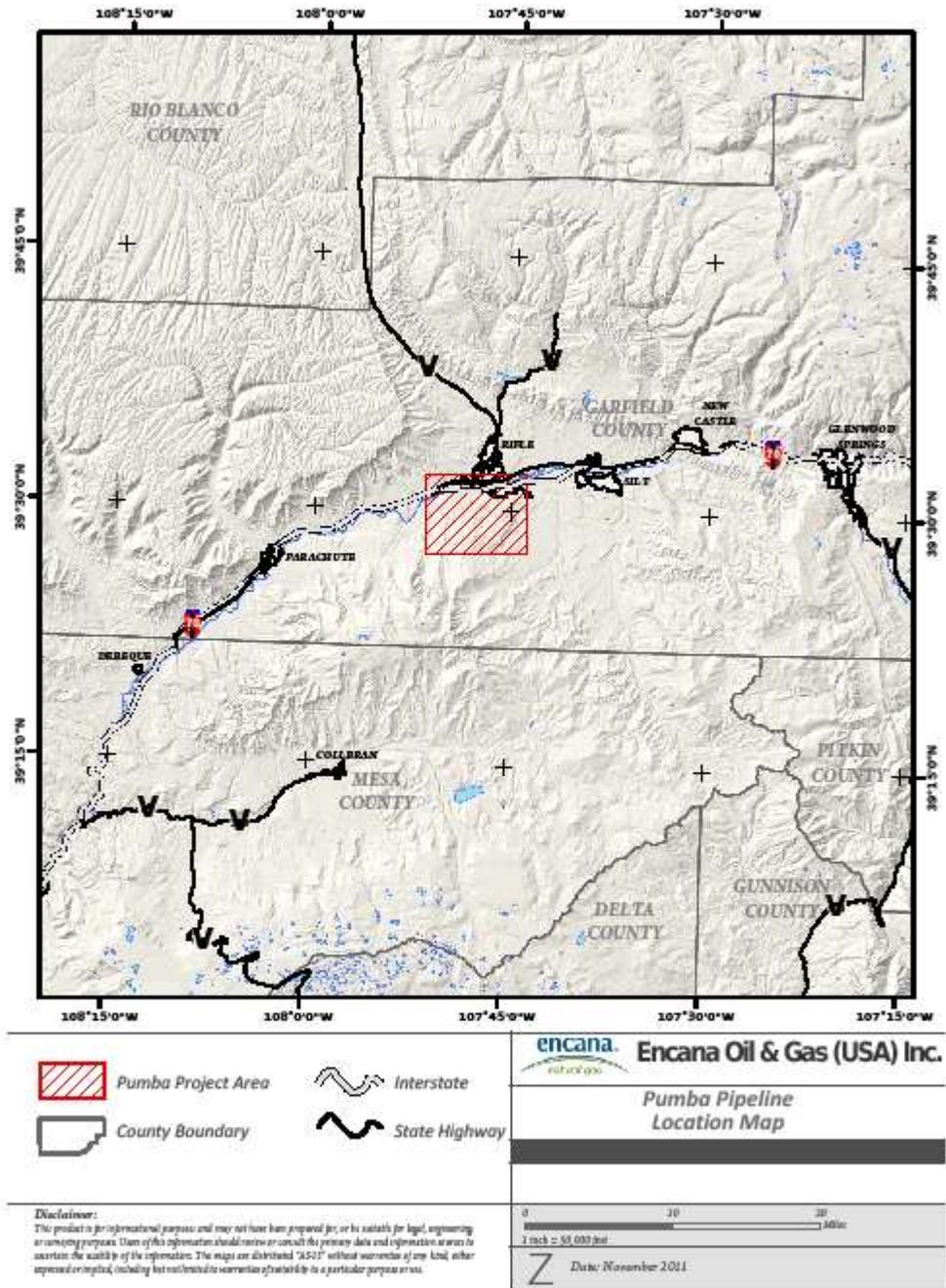


Figure 1. Location Map

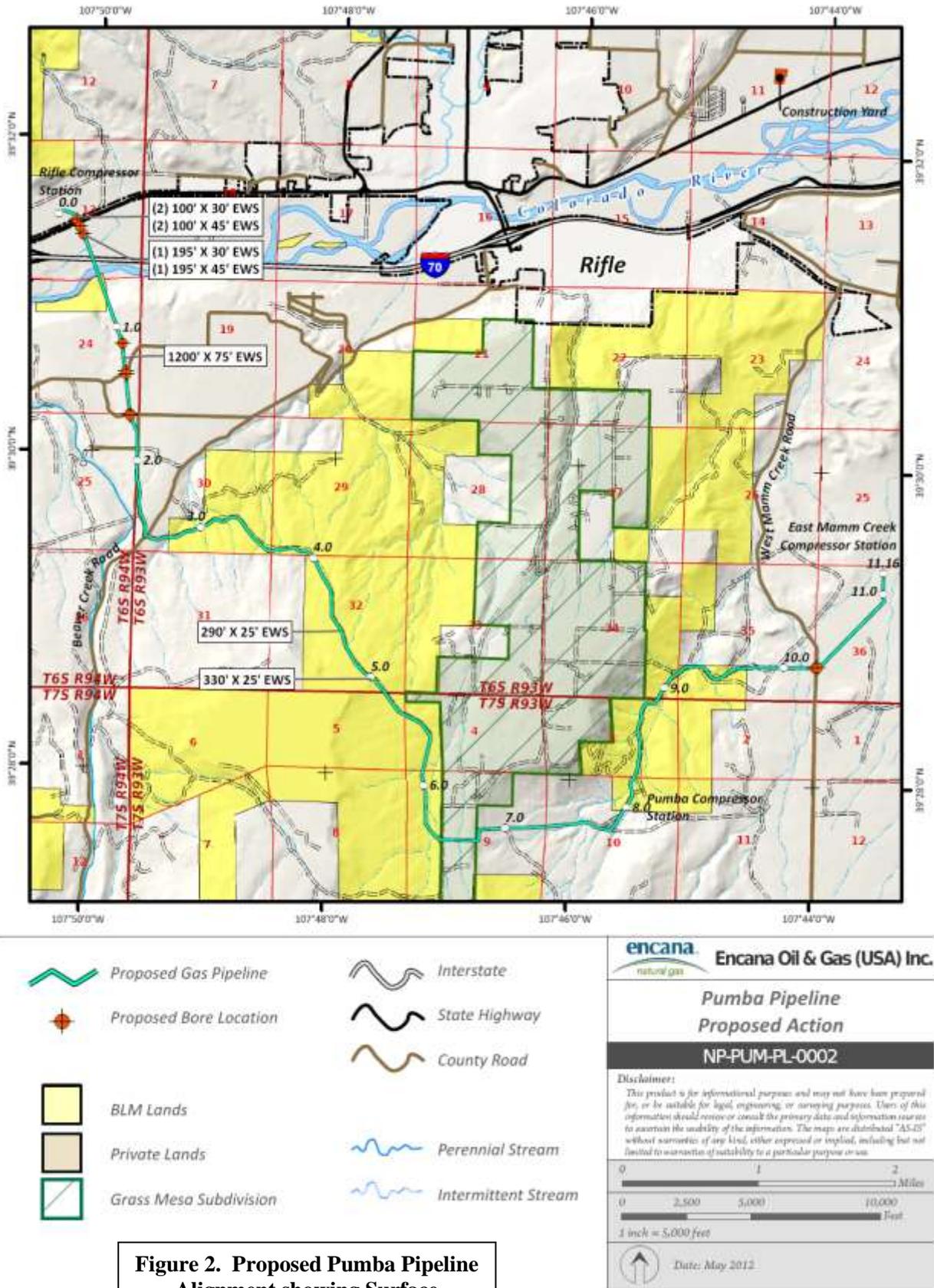


Figure 2. Proposed Pumba Pipeline Alignment showing Surface Ownership and Mileposts

1.3 Public Scoping

On January 17, 2012, the BLM sent a letter to members of the Grass Mesa Homeowners Association Board to announce the availability of the Proposed Action for public review and comment. Additionally, a press release was published in the Glenwood Springs *Post Independent* and the Rifle *Citizen Telegram*, and the Proposed Action was posted on the BLM's Colorado River Valley Field Office (CRVFO) website. The BLM received two comment letters on the proposal. The issues raised in those letters are addressed in this EA. Appendix B presents copies of those letters along with a synopsis of the comments and BLM responses.

The Proposed Action initially included a 24-inch natural gas pipeline and a 16-inch water pipeline to be installed in two separate construction seasons. The current proposal has been amended to include only a 30-inch natural gas pipeline to be installed in a single season. A water pipeline is no longer included in this proposal. Although BLM's guidance for preparing impact analysis pursuant to the National Environmental Policy Act (NEPA) emphasizes not "piecemealing" complex projects into separate documents, NEPA guidance also recognizes that some future actions may be too speculative for analysis. Because Encana's projected need for the water pipeline is not directly tied to its need for the natural gas pipeline, and because the timing of the need for the pipeline remains uncertain, the BLM concluded that a separate analysis at the time the water pipeline is actually needed would be appropriate.

1.4 Authorizing Actions and Relationship to Statutes and Regulations

Encana has submitted to the CRVFO an application for a right-of-way grant to allow construction of the proposed Pumba Pipeline across BLM-administered Federal land pursuant to the Mineral Leasing Act of 1920 (MLA), as amended. The MLA (Sec. 28 (a)) authorizes Federal agencies to grant rights-of-way (ROWs) for pipeline purposes for the transportation of oil, natural gas, synthetic liquid or gaseous fuels, or any refined product produced. The MLA (Sec. 28 (e)) further gives Federal agencies authority to allow temporary uses of Federal lands for construction, operation, and maintenance of pipelines. The BLM implementing regulations for this portion of the MLA are found at 43 CFR 2800/2880 and 36 CFR 251.

The MLA directs Federal agencies to require the applicant to submit a plan of construction, operation, and rehabilitation for ROWs. Encana's submission of a Plan of Development (POD) with its ROW application satisfies this requirement. Until the ROW grant is issued, the POD is a working document subject to revisions and improvements that would be considered final upon issuance of the ROW grant. In addition, the MLA at Sec. 28 (h)(2) gives Federal agencies the authority to impose stipulations on pipeline projects for the following:

- (A) Requirements for restoration, revegetation, and curtailment of erosion of the surface of the land.
- (B) Requirements to insure that activities in connection with the ROW or permit would not violate applicable air and water quality standards or related facility siting standards established by or pursuant to law.
- (C) Requirements designed to control or prevent:
 - Damage to the environment (including damage to fish and wildlife habitat)
 - Damage to public or private property
 - Hazards to public health and safety
- (D) Requirements to protect the interests of individuals living in the general area of the ROW or permit who rely on the fish, wildlife, and other biotic resources of the area for subsistence purposes. Such regulations shall be applicable to every ROW granted.

In addition to issuance of a ROW grant and temporary use permit (TUP) under the MLA and preparation of this Environmental Assessment (EA) pursuant to NEPA, the project would require the following regulatory approvals:

- U.S. Army Corps of Engineers – Pre-Construction Notification (PCN) under Nationwide Permit 12 (NWP12) for any discharge of dredged or fill material into waters of the U.S., including stream channels, floodplains, and jurisdictional wetlands, as defined by Section 404 of the Clean Water Act.
- State of Colorado, Department of Public Health and Environment – Air Pollution Emission Notice (APEN) submitted to the Air Quality Control Division in relation to construction-related fugitive dust. Stormwater Discharge Permit from Water Quality Control Division in relation to runoff from disturbed ground surfaces.
- State of Colorado, Department of Transportation –Special Use Permit for construction of a pipeline bore beneath the Colorado River.
- Garfield County Road and Bridge – Utility permits.
- City of Rifle – Watershed Permit for construction within the City of Rifle Watershed.

The project proponent, Encana, is responsible for obtaining and complying with these and other legal requirements.

1.5 Decisions to be Made Based on this Environmental Assessment

Pursuant NEPA, the outcome of this Environmental Assessment (EA) is a Decision Record documenting that the Proposed Action would either significantly or not significantly affect the human environment. In the case of the latter, BLM would prepare a Finding of No Significant Impact (FONSI). In the case of the latter, BLM would prepare an Environmental Impact Statement (EIS). The responsible official will decide on an alternative based on the analysis contained in this EA. This analysis considers the environmental consequences of the Proposed Action as submitted by Encana and modified in consultation with the BLM, as well as a variety of mitigation measures identified by BLM and attached to the ROW grant and TUP as protective stipulations (Appendix A).

The Decision Record associated with this EA does not itself constitute approval of the Proposed Action but instead provides a basis for BLM to issue the respective ROW grant and TUP. These realty actions in turn would authorize commencement of ground-disturbing activities, installation and use of the pipeline, and eventual closure of the pipeline in segments crossing BLM-administered Federal lands.

1.6 Plan Conformance Review

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

Name of Plan: Glenwood Springs Resource Management Plan (BLM 1984, revised 1988).

Dates of Relevant Amendments: November 1991 – Oil and Gas Leasing and Development – Final Supplemental Environmental Impact Statement; March 1999 – Oil & Gas Leasing & Development Final Supplemental Environmental Impact Statement.

Construction would likely occur in two phases; Phase I would begin in spring 2012 and would involve boring under the Colorado River using horizontal directional drilling techniques. Anticipated completion

of this construction phase would be approximately four to six months. Concurrently, Phase II would include installation of the gas pipeline from the East Mamm Creek compressor station to the southern bore location. Anticipated completion of this construction phase would also be 4 to 6 months. Site reclamation would occur after completion of the gas pipeline installation and would be completed prior to winter of 2012. The pipeline would be operated on a year-round basis.

The pipeline would be installed at a minimum depth to provide at least 36 inches of cover above the pipe. One wetland would be crossed, and nine drainages would be crossed with the proposal. Depending on the time of construction and the amount of flowing water, Encana would flume the drainages to maintain water flow, if necessary. This would require verification by the USACE that the work is authorized under existing Nationwide Permit 12 (Utility Line Activities).

The Proposed Action consists of permanent below-ground and above-ground pipeline facilities as well as temporary facilities needed during construction. Permanent facilities include meter stations/valve sets, pipeline markers, and cathodic protection (anti-corrosion) test stations. The various segments of the pipeline and associated facilities would be installed in compliance with BLM and private landowner stipulations, as applicable. After installation of the pipeline, all disturbed areas (including the ROW, vehicle travel routes, and staging areas) would be returned to pre-construction contours and drainage patterns. Topsoil would then be replaced into areas from which it was stripped. Revegetation via seeding would be the primary method to stabilize soils and ensure permanent erosion control over the long term. Encana would be responsible for monitoring of pipeline operations once construction is completed.

2. ALTERNATIVES

2.1 Proposed Action

Table 1 provide summary data for the pipeline relative to surface ownership and surface disturbance. Figure 1 is a general location map for the project. Figure 2 shows the proposed action in greater detail, including locations and types of surface disturbance.

Table 1. Pipeline Length and Impact Area for Proposed Action					
<i>Pipeline Segment Lengths</i>					
Pipeline Length	Length Collocated with Existing Pipeline	Surface Ownership		New Pipeline in Relation to Existing ROW	
		BLM lands	Private lands	Within ROW	Outside ROW
11.2	6.3	5.6	5.6	9.6	1.6
<i>Impact Area</i>					
Ownership	Permanent ROW	Temporary ROW	Extra Work Spaces	Totals	
Federal - BLM	33	16.5	0.4	49.9	
Private	29.2	14.7	2.7	46.6	
Totals	62.2	31.2	3.1	96.5	

Major elements of the Proposed Action are described below. These elements include standard and project-specific surface-use lease/ROW stipulations to avoid, minimize, or mitigate impacts to natural resources as a result of the Proposed Action. The BLM stipulations are provided in Appendix A.

Table 2 lists the legal descriptions for aliquot parts of BLM land to be crossed by the Proposed Action (see Figure 2). Privately owned surface lands are not included in the table.

Table 2. Pumba Pipeline Legal Descriptions (West to East)			
<i>Township</i>	<i>Range</i>	<i>Section</i>	<i>Legal Description</i>
T6S	R94W	24	Lot 7, Lot 6
T7S	R93W	3	Lot 1, W1/2 SE1/4
		4	W1/2 SW1/4
		5	NE1/4 SE1/4, Lot 1
		9	S1/2 NE1/4, NW1/4 SE1/4, N1/2 SW1/4, SE1/4 SW1/4, W1/2 NW1/4
		10	W1/2 NE1/4, S1/2 NW1/4
T6S	R93W	29	S1/2 SW1/4
		30	SE1/4, SE1/4 SW1/4, Lot 4, Lot 3, Lot 2
		32	SE1/4, NE1/4 SW1/4, E1/2 NW1/4

2.1.1 Project Access

Encana would primarily use existing roads to gain access to the construction workspace. No road improvements would be required. Roads would be maintained to the original condition post-construction. Access to the northern portion of the project would originate from Interstate 70 (I-70) at Exit 87; US Highway 6 generally parallels I-70 toward Rifle as a north frontage road. The Rifle compressor station and northern bore terminus location are reached by travelling northeast from Exit 87 along US 6 for approximately 0.4 mile. The southern bore location is reached from Taughenbaugh on Mesa Road (County Road 321); access requires crossing private land.

Access to the southern portion of the project would originate from Mamm Creek Road (CR319), which accesses Hunter Mesa, the existing Pumba compressor station, and the existing East Mamm compressor station. Portions of the project would not be accessible from existing roads. In these cases, travel lanes would be established within the ROW limits to allow traffic to flow between access roads.

Rose Ranch Road would be used as the preferred route to access portions of the pipeline on or near the southern portion of the Grass Mesa subdivision. It would also serve as emergency access during pipeline installation along the BLM Grass Mesa Road. The Traffic Control Plan and Emergency Access Plan are included in the Plan of Development (POD), which is on file at the CRVFO. This plan includes a number of items related to traffic control and access.

2.1.1 Project Facilities

A 75-foot-wide work area would be required on both Federal and private lands during construction, of which 50 feet would be maintained as a permanent pipeline ROW. Encana has identified nine EWSs to facilitate construction of the pipeline. Two of these areas between pipeline Mileposts (MPs) 4 and 5 are necessary because of the steep topography. One large staging area located south of MP 1 would be used during mobilization and demobilization of equipment and for the delivery of pipe and materials for the bore under the Colorado River. This bore ends at approximately MP 0.2, with two smaller EWSs

identified in that field. Four additional EWSs are proposed for staging equipment and materials associated with the conventional bore under US 6 to the Rifle compressor station (two on each side).

Permanent facilities would include meter stations/valve sets, pipeline markers, and cathodic protection (anti-corrosion) test stations. These facilities would be located within the permanent ROW. Valves would be installed on both sides of the Colorado River on both lines. These facilities would be finalized upon completion of the engineered design.

Civil engineering surveys were performed by Wasatch Surveying to identify the centerline of the pipeline and the boundaries on both sides of the ROW. Independent Environmental Inspectors (EIs) retained by Encana would be responsible for verifying that the limits of authorized construction work areas are staked and approved access roads are signed prior to construction.

2.1.2 Construction

The following sections describe the various pipeline construction phases, which are typical for a project of this type.

Clearing and Grading

Exclusion fencing would be installed prior to clearing and grading as appropriate to protect sensitive vegetation and cultural resources. Survey monuments have been located as part of the civil survey effort and are determined not to be at risk from proposed construction activities. Temporary fencing for livestock will be installed as necessary in areas where grazing occurs.

Clearing, grading, and other disturbance of soil and vegetation would be limited to the minimum area required for safe construction operations within the approved ROW and extra workspaces. Trees would be cut with a chain saw and/or mechanical shears and brush would be generally cut with a hydro-axe to avoid disturbance of root systems. Trees and brush would be cut as close to the ground as possible. Root systems of trees would be left in place where feasible and where they would not pose a safety concern for workers or an impediment to equipment or rubber-tired vehicle access. The crowns of herbaceous vegetation would be retained to the extent possible where grading of the ROW and extra workspaces are not necessary.

Once clearing has been performed to remove any obstacles or debris, grading would follow to remove the topsoil and surface rock. Up to 6 inches of topsoil would be stockpiled separately along the edge of the ROW for redistribution following construction. Where the ROW parallels existing pipelines, the topsoil would be placed over the existing pipelines to ensure that topsoil is not mixed with trench spoils.

All brush and other woody plant materials that are cleared would be shredded using a hydro-axe and mixed with topsoil within the ROW or in temporary use areas unless otherwise specified. Following construction, these materials would be dispersed over the ROW. No brush would be windrowed along the ROW.

Trenching

Construction methods used to excavate a trench would vary depending on soil, terrain, and related factors. Rotary trenching machines would be used where possible. In situations such as steep slopes, unstable soils, high water table, or deep or wide trench requirements, conventional tracked backhoes (trackhoes) would generally be used. Measures would be taken to ensure that access is provided for property owners or tenants to move vehicles, equipment, and livestock across the trench where necessary. Adequate

precautions would also be taken to ensure that livestock are not prevented from reaching water sources because of the open trench. These would include contacting livestock operators, providing adequate crossing facilities or other measures as needed.

A typical trench would be excavated approximately 36 inches wide at the bottom, with the sides sloped to Occupational Safety and Health Administration (OSHA) specifications. The depth of the trench would be approximately 66 to 72 inches but would vary with the conditions encountered. The minimum pipe depth of 36 inches of cover from top of pipe would be maintained at all times in conformance with U.S. Department of Transportation (USDOT) regulations. Occasionally, the trench would be excavated to depths greater than the minimum values specified due to topography issues. Greater depths of cover would be required at crossings of unpaved roads, other pipelines, streams, or other obstructions. At a minimum, the trench would be excavated to a depth to allow a clearance of 24 inches between the pipeline and other pipelines or underground facilities. Other pipelines exposed during trenching would be padded to prevent damage. Machine excavation would not be performed closer than 10 feet from any existing pipeline encountered in the ROW unless authorized by the owner/operator of that pipeline. Existing pipeline locations would be marked in the field and 48-hour prior notification given to the operator of the underground utility.

Pipeline crossings of unimproved, lightly traveled, or rural roads (Table 3) would be made with a mechanical ditching machine or a backhoe. Installation at these locations, including cleanup and restoration of road surfaces, would usually be completed within one day. In such cases, the public would be given 72 hours' notice of any closures and provisions would be made to detour or control passage of traffic during construction.

Where large rocks are encountered, hydro-hammers, tractor-mounted mechanical rippers or rock trenching equipment may be used to facilitate excavation. No blasting is anticipated.

Borings

Borings would generally be used under Garfield County roads (Table 3) to avoid disrupting traffic in accordance with the governing agency requirements and permitting agreements. Auger boring would be implemented for these installations. Unimproved roads would likely be open cut. Refer to the Proposed Action figure for proposed road crossings.

Auger boring involves excavating a bore pit on one side of the crossing and a receiving pit on the other side. A power unit mounted on rails or a side-boom boring machine attached to a dead-man is used to drive the auger inside a heavy-walled pipe casing until the power unit reaches the leading edge of the bore pit. The power unit is disconnected from the auger, backed up, and a segment of the carrier pipe welded to the casing segment already driven. Additional auger and carrier pipe segments are added successively until the bore reaches the other side of the crossing in the receiving pit. Soil excavated by the auger is removed from the pit by a backhoe. Once through, the power unit backs out the auger one segment at a time, leaving the gas pipeline in place under the crossing. In the receiving pit, the casing segment is removed for use at the next crossing.

Horizontal directional drilling (HDD) would be implemented for the bore under the Colorado River, a distance of approximately 0.9 mile. This method is typically used to avoid disturbance of sensitive surface features, including water bodies and wetlands. The process uses drilling fluid consisting primarily of water and bentonite, a naturally occurring clay. The drilling fluid is prepared in the mixing tank using both new and clean recycled drilling fluid. The fluid is pumped at rates of 200 to 1,000 gallons per minute (gpm) through the center of the drill pipe to the cutters. Return flow is through the annulus created between the wall of the boring and the drill pipe.

Table 3. Road Numbers and Type to be Crossed by Pumba Pipeline		
<i>Road Name</i>	<i>Surface Type</i>	<i>Construction Method</i>
US Highway 6	Paved	Bore
Interstate 70 (Westbound)	Paved	Bore
Interstate 70 (Eastbound)	Paved	Bore
CR321, Taughenbaugh Mesa Road	Paved	Bore
CR320, Rifle-Rulison Road	Paved	Bore
CR319, West Mamm Creek Road	Paved	Bore
CR317, Beaver Creek Road	Gravel	Open Cut
CR334	Unimproved	Open Cut
East Mamm Creek Access Road	Unimproved	Open Cut
CR334A, Samon Lane	Dirt	Open Cut
Unnamed Pad Access Road	Dirt	Open Cut
Private Residential Driveway	Dirt	Open Cut
Access to Leverich 31-09 Pad	Dirt	Open Cut
8193A, BLM/Grass Mesa Road	Dirt	Open Cut (2)
8193E	Dirt	Open Cut (3)

One pit would be constructed at both the entry and exit points of the bore to provide temporary storage for the drilling fluid. In the entry pit, the fluid is pumped to the fluid processing equipment. Typically, shaker screens, de-sanders, de-silters, and centrifuges remove increasingly finer cuttings from the drilling fluid. As stated previously, Encana plans to conduct test coring and sampling along the length of the planned Colorado River bore to determine the feasibility of the subsoils for horizontal drilling.

The cleaned fluid is recycled to the mixing tank and pumps for reuse in the borehole. The excess cuttings are disposed of at a site approved to accept this type of material. Directional drilling does, however, present a remote potential for surface disturbance through inadvertent drilling fluid releases. Drilling fluid releases are typically caused by pressurization of the drill hole beyond the containment capability of the overburden soil material, which allows the drilling fluid to flow to the ground surface. A minimum thickness of 25 feet in competent soils would be maintained to provide a margin of safety against seepage of drilling fluid.

Pipe Installation

Pipe installation would include stringing, bending for horizontal or vertical angles in the alignment, welding the pipe segments together, X-ray inspection, coating the joint areas to prevent corrosion, and then lowering-in and padding.

Line pipe would be shipped directly from the manufacturer by trucks to the WCC yard and directly to the ROW. Each individual joint of pipe would be unloaded by sucker hoes or tractors equipped with side booms and slings, and strung parallel to the trench. Sufficient pipe for road or stream crossings would be

stockpiled at staging areas near the crossings. Longer pipe segments associated with the HDDs would be staged parallel to one another within the approved EWSs.

Stringing operations would be coordinated with trenching and installation activities to properly manage the construction time at a particular tract of land. Gaps would be left at access points across the trench to allow crossing of the ROW.

After the joints of pipe are strung along the trench but before the joints are welded together, individual joints of the pipe would be bent to accommodate horizontal and vertical changes in direction. Field bends would be made utilizing a hydraulically operated bending machine. Where the deflection of a bend exceeds the allowable limits for a field-bent pipe, factory (induction) bends would be installed.

After the pipe joints are bent, the pipe would be lined up end-to-end and clamped into position. The pipe would then be welded ASME Code B31.8 for Gas Transmission and Distribution Piping Systems and ASME Code B31.4 for Pipeline Transportation Systems for Liquids (water).

All welds would be visually inspected by a qualified inspector using non-destructive radiographic methods. At a minimum, radiographic inspection would be conducted in accordance with USDOT requirements. A specialized contractor, certified to perform radiographic inspection, would be employed to perform this work. Any defects would be repaired or cut out as required under the specified regulations and standards.

To prevent corrosion, the pipe would be externally coated with fusion bonded epoxy coating prior to delivery. After welding, field joints would be coated using field-applied fusion bond epoxy. Before the pipe is lowered into the ditch, the pipeline coating would be visually inspected and tested with an electronic detector, and any faults or scratches (holidays) would be repaired.

Before the pipe section is lowered into the ditch, visual inspection would verify that the pipe is properly fitted and installed into the ditch, minimum cover is provided, and the trench bottom is free of rocks and other debris that could damage the external pipe coating. Side-boom tractors would be used to simultaneously lift the pipe section, position it over the ditch, and lower it in place. Padding machines would be used to sift soil fines from the excavated subsoils to provide rock-free pipeline padding pipe cover minimum of twelve inches. Sandbags would be used to support the pipe and maintain a minimum of six inches clearance from the bottom of the trench. In rocky areas, padding material or a rock shield would be used to protect the pipe. No topsoil would be used to pad the pipe.

Backfilling

Backfilling begins after a section of the pipe has been successfully placed in the trench and final inspection has been completed. Backfill would be conducted using bulldozers and track hoes. Backfilling of the trench would generally use the subsoil previously excavated from the trench, except in rocky areas where imported select fill material may be needed. Backfill would be graded and compacted by being tamped or walked in with a wheeled or tracked vehicle. Compaction would be performed to the extent that there are no voids in the trench. Backfill of trenches would not be performed where the soil is frozen to the extent that large consolidated masses are formed that would not “break down.” In agricultural areas, the backfill would be replaced at the same compaction density as the adjacent undisturbed soil. Any excavated materials or materials unfit for backfill would be utilized or properly disposed of in conformance with applicable laws or regulations.

The final step in backfilling is to place a mound over the trench approximately six inches high to account for subsidence as practical, on Federal lands. A variance is required to eliminate the mound. On private lands, written authorization from the property owner is required to eliminate the mound.

Pressure Testing

The entire pipeline would be tested in compliance with USDOT regulations (49 CFR Part 192). Prior to filling the pipeline for a hydrostatic test, each section of the pipeline is cleaned by passing reinforced poly pigs through the interior of the line. Incremental segments of the pipeline are then filled with water to achieve 1.5 times the maximum allowable operating pressure (MAOP) and held for the duration of the test of 8 hours minimum for buried pipe and 4 hours minimum for above ground test segments.

Typically, the hydrostatic tests of individual segments would be conducted in sequence and the is located on Encana land and is used for fresh water storage for Encana's operations. Approximately 8 million gallons (24.5 acre-feet) of water would be needed for hydrostatic testing. Water for hydrostatic testing would utilize portable pumps driven by diesel engines. To prevent environmental damage from potential diesel fuel spills during the operation of the engine(s), additional measures would be implemented when the pumps are located within 200 feet of a water body. Test water would be discharged to approved locations in accordance with applicable permit requirements. These locations would be identified upon completion of the engineered design. Water would be discharged within the same drainage basin using best management practices (BMPs).

2.1.3 Cleanup and Reclamation

Cleanup and reclamation would occur after the pipeline is installed and backfill activities are completed. Cleanup of the surface along the construction workspace and EWS areas would include removing construction debris and by performing final grading to the finished contour. Subsoil would be decompacted to a depth of 6 to 10 inches prior to topsoil replacement and topsoil returned to pre-construction depths and locations. Erosion control measures would be installed as appropriate. Additional information on measures to protect surface waters and ensure appropriate reclamation of disturbed areas is provided in Appendix A. Revegetation via seeding would be the primary method to stabilize soils and ensure permanent erosion control over the long term. Seed mixes, to be approved by the BLM prior to purchase and installation, would reflect environmental conditions and ecological range sites along the project route and emphasize the use of native species. Seed mixes, rates, and application areas are provided in the Reclamation Plan in accordance with fee-landowner and BLM requirements. Requirements for revegetation are presented in Appendix A. Every effort would be made to complete final cleanup and installation of permanent erosion control measures within 30 days after final backfilling is completed.

2.1.4 Operations and Maintenance

Encana would be responsible for monitoring the operation of the pipeline once construction is completed. Maintenance and operating personnel would be coordinated from the Parachute office to ensure that any area can be reached within a short period in case of an emergency or malfunction. Encana would develop an Emergency Plan for the USDOT regulated pipelines that would be followed by Encana employees in the event of an emergency. The plan would establish written procedures that are intended to minimize the hazards in the event of a gas pipeline emergency. The Emergency Plan included as part of the POD addresses topics such as administrative issues, emergency planning, assignment of responsibilities, handling and evaluating emergency calls, responding to and controlling emergency situations, news media communications, restoration of service, obtaining and reporting emergency information, employee

training, liaison with public officials, general public information program, location/inventory of pipeline repair materials and equipment, and lists of emergency telephone numbers and key personnel.

2.1.5 Design Criteria, Stipulations, and Best Management Practices (BMPs)

Industry-standard BMPs for resource protection would be employed throughout the project. Encana has also committed to follow certain mitigation measures (also known as “design criteria”) as part of the proposed construction and maintenance activities. These mitigation measures/design criteria outlined in the POD that accompanied the ROW application would be followed during construction, operation, and maintenance of the pipeline and associated facilities, as appropriate. BLM conditions of approval (COAs) and right-of-way stipulations to be applied to the project are listed in Appendix A.

2.2 **No Action Alternative**

Council on Environmental Quality (CEQ) regulations require the BLM to analyze the No Action Alternative in comparison to the Proposed Action. In this case, the No Action Alternative would consist of denial by the BLM of the ROW application submitted by Encana for use of Federal land. Consequently, construction of the pipeline would not occur on BLM land on this alternative. Although the operator could install the pipeline entirely across private land, the routes would be widely circuitous and possibly cost-prohibitive. If an entirely non-Federal alignment were constructed, it would be expected to be in proximity to the Colorado River corridor, where the residential population is more concentrated and where resource impacts are likely to be more pronounced. Because no alternative non-Federal alignment has been identified by Encana, such an alignment is speculative, and this EA therefore assumes that the No Action Alternative would constitute abandonment of the project as proposed.

3. **AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

During its internal scoping process for this EA, the BLM identified the following elements of the natural and human environment as present in the project vicinity and potentially affected by the project:

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

The following subsections describe current conditions, potential impacts, and mitigation measures relative to these resources and resource uses.

3.1 **Access and Transportation**

Affected Environment

Encana would primarily use existing roads to gain access to the construction workspace. No road improvements would be required. Roads would be maintained to the original condition post-construction.

Access to the northern portion of the project would originate from I-70 at Exit 87 and then along US Highway 6 toward Rifle a distance of approximately 0.4 mile to the Rifle compressor station and the northern bore terminus location. Access to the southern bore location, located on private lands, would be from Taughenbaugh Mesa Road (CR321).

Access to the southern portion of the project would originate from Mamm Creek Road (CR319), which accesses Hunter Mesa, the existing Pumba compressor station, and the existing East Mamm compressor station. From CR319, the Lake Fox tie-in would be accessed via the BLM Grass Mesa Road or the Rose Ranch Road. Mamm Creek Road can be reached by travelling east on Airport Road from interchange 90 for approximately 1.75 miles.

Environmental Consequences

Proposed Action

Public access to the project area is available along the routes mentioned above. Portions of the project would not be accessible from existing roads and, in these cases, travel lanes would be established within the ROW limits to allow traffic to flow between access roads.

Rose Ranch Road would be used as the preferred route to access portions of the pipeline installation on or near south Grass Mesa subdivision. It would also serve as emergency access during pipeline installation along the BLM Grass Mesa Road. The Traffic Control Plan and Emergency Access Plan are included in the Plan of Development on file at the CRVFO. This plan includes a number of items related to traffic control and access.

Construction activities would begin and end after the average workday, as practical, to minimize traffic congestion impacts to the public. The Willow Creek construction yard would be used as the primary parking area for personal vehicles, and the majority of pipeline construction workers would be transported to the construction right-of-way by buses, as practical. However, the Proposed Action would result in increased truck traffic on roads used to access the project area. Because the pipeline would be constructed in segments, construction traffic would not be constant along all segments of the proposed pipeline. Anticipated types and numbers of construction equipment to support the clearing of ROW, installation of pipeline, completion, and interim reclamation include:

- 15 welder trucks
- 12 side booms
- 10 bulldozers
- 10 contractor pickup trucks
- 10 inspector pickup trucks
- 8 trackhoes
- 7 stringing trucks
- 3 challengers and sleds
- 2 bending machines
- 2 water trucks
- 2 X-ray trucks
- 2 mechanic trucks
- 1 skid truck
- 1 boom truck
- 1 winch truck
- 1 fuel truck
- 1 service truck
- 1 pipe gang bus

The proposed construction would require a crew of approximately 150 people. Carpooling efforts would consist of a pipe gang bus; the other workers need special equipment in their trucks, which means that trucks need to travel to and from the work area daily. Proposed work hours would be six days per week, ten hours per day. Once the pipeline has been installed, traffic would decrease to occasional visits for monitoring and maintenance activities. Access to the BLM Grass Mesa Road would be temporarily affected during construction associated with a road crossing of the pipeline. During this time, alternative access to Grass Mesa subdivision would be via Rose Ranch Road. Otherwise, the BLM Grass Mesa Road

would remain open and safe to the public during construction activities. Mitigation measures to be applied as COAs (Appendix A) would be required to ensure adequate safety for users in the area, dust abatement, and access to occur.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting access and transportation are anticipated.

3.2 Air Quality

Affected Environment

State of Colorado and Federal air quality regulations are enforced by the Colorado Department of Public Health and Environment (CDPHE). Colorado Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS) are health-based criteria for the maximum acceptable concentrations of air pollutants in areas of public use.

Although specific air quality monitoring has not been conducted within the project area, regional air quality monitoring has been conducted in Rifle and elsewhere in Garfield County. Air pollutants measured in the region for which ambient air quality standards exist include carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), ozone (O₃), particulate matter less than 10 microns (μ) in diameter (PM₁₀), and particulate matter less than 2.5 μ in diameter (PM_{2.5}).

The project area lies within Garfield County, which has been described as an attainment area under CAAQS and NAAQS. An attainment area is an area where ambient air pollution quantities are below (i.e., better than) NAAQS standards. Regional background values are well below established standards, and all areas within the cumulative study area are designated as attainment for all criteria pollutants.

Federal air quality regulations adopted and enforced by CDPHE limit incremental emissions increases to specific levels defined by the classification of air quality in an area. The Prevention of Significant Deterioration (PSD) program is designed to limit incremental increases for specific air pollutant concentrations above a legally defined baseline level, as defined by an area's air quality classification. Incremental increases in PSD Class I areas are strictly limited, while increases allowed in Class II areas are less strict. The project area and surrounding vicinity are classified as PSD Class II. The closest PSD Class I areas are the Flat Tops Wilderness (approximately 30 miles north), Maroon Bells-Snowmass Wilderness (approximately 29 miles south), West Elk Wilderness (approximately 50 miles southeast), Black Canyon of the Gunnison National Monument (approximately 50 miles south), and Eagles Nest Wilderness (approximately 65 miles east). Dinosaur National Monument (approximately 80 miles northwest) is listed as a PSD Class II.

Environmental Consequences

Proposed Action

CDPHE, under its Environmental Protection Agency (EPA)-approved state implementation plan, is the primary air quality regulatory agency responsible for determining potential impacts once detailed industrial development plans have been made; those development plans are subject to applicable air quality laws, regulations, standards, control measures, and management practices. CDPHE has the ultimate responsibility for reviewing and permitting air quality emissions prior to implementation of a

project. Unlike the conceptual “reasonable but conservative” engineering designs used in NEPA analyses, any CDPHE air quality preconstruction permitting required would be based on site-specific, detailed engineering values, which would be assessed in CDPHE’s review of the permit application.

Pipeline construction is expected to take approximately 180 days. Activities described in the Proposed Action would result in localized short-term increases in emissions during brush clearing of the ROW, construction of access roads, topsoil stockpiling, trenching, pipe delivery, pipeline installation, backfilling, and reclamation. Pollutants generated during construction activities would include emissions from vehicles and heavy equipment and fugitive dust (PM₁₀ and PM_{2.5}) associated with soil disturbance and travel on unpaved roadways. Construction activities for the pipeline would occur 6 days per week, 10 hours per day. Once construction activities are complete, air quality impacts associated with these activities would diminish dramatically and decrease to near zero over current levels as revegetation progresses to a sufficient, self-sustaining perennial plant cover.

The width of pipeline ROW clearing would be kept to a practical minimum to avoid undue disturbance to existing vegetation. Where topsoil removal and storage is not necessary, brush clearing will be limited to removal of above ground vegetation to avoid disturbance of root systems, which will help reduce fugitive dust. In addition BLM would require that Encana apply water dust suppressant to access roads during the development phase.

CDPHE requires an Air Pollutant Emission Notice (APEN) and construction permit for land development activities which disturb greater than 25 contiguous acres. The operating terms and conditions of the construction permit require particulate emissions control measures for all activities associated with the project, including surface disturbance and haul roads. EnCana is responsible to obtain the permit before any construction begins on the pipeline.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting air quality are anticipated.

3.3 Cultural Resources (Archaeology)

Affected Environment

Cultural resources are fragile and nonrenewable remains of prehistoric and historic human activity, occupation, or endeavor as reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features. Cultural resources comprise the physical remains themselves and the areas where significant human events occurred.

The National Historic Preservation Act (NHPA) of 1966 and the Archaeological Resource Protection Act of 1979 provide for the protection of significant cultural resources and traditional cultural properties. Section 106 of the NHPA describes the process that Federal agencies must follow to identify, evaluate, and coordinate their activities and recommendations concerning cultural resources. Significant cultural resources are defined as those listed on, or eligible for, listing on the National Register of Historic Places (NRHP) and are referred to as historic properties.

Two literature reviews were conducted specifically for the Pumba Pipeline project via Colorado’s On-line Cultural Resource Database (Compass) and BLM CRVFO records. These literature reviews indicated that six previously recorded sites were located within the survey area. None of the previously recorded

sites encountered is recommended as NRHP eligible. A Class III cultural resource inventory (CRVFO# 16912-1) was conducted in September and October 2011; approximately 575 acres of the project area was intensively surveyed. The survey included a 400-foot- wide corridor centered on pipeline staking. A total of two sites and three isolated finds were discovered, while three previously recorded sites were encountered and updated. Three sites previously recorded in the survey area were not re-located; they appear to be lost to modern impacts. By definition, the isolated finds are not eligible to the NRHP. Of the two discovered sites, one is not recommended to be NRHP eligible; the other site (5GF4633.1) requires additional data in order to further evaluate its significance. However, the segment of this site recorded in the project area follows a maintained county road and does not retain any aspects of integrity that would support NRHP eligibility.

Environmental Consequences

Proposed Action

Implementation of the Proposed Action would have no direct impacts to known “historic properties” because project design avoids these resources. The BLM made a determination of “**No Historic Properties Affected**” for this project. This determination was made in accordance with the 2001 revised regulations [36CFR 800.4(d)(1)] for Section 106 of the National Historic Preservation Act (16U.S.C 470f), the BLM/State Historic Preservation Officer (SHPO) Programmatic Agreement (1997) and Colorado Protocol (1998)]. As the BLM has determined that the Proposed Action would have no direct impacts to known “historic properties,” no formal consultation was initiated with the SHPO.

A standard Education/Discovery COA for cultural resource protection would be attached to APDs for any surface disturbance or drilling of wells pursuant to this EA (see Appendix A). The importance of this COA would be stressed to the operator and its contractors, including informing them of their responsibilities to protect and report any cultural resources encountered during construction operations. Indirect long-term cumulative impacts from increased access and the presence of project personnel could result in a range of impacts to known and undiscovered cultural resources in the vicinity of the project location. These impacts could include accidental damage, vandalism, or illegal collection and excavation.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting cultural resources are anticipated.

3.4 Fossil Resources (Paleontology)

Affected Environment

The current classification system utilized by the BLM for assessing impacts to fossil resources is the Potential Fossil Yield Classification System (PFYC). This system classifies geologic units based on the relative abundance of vertebrate fossils or scientifically important invertebrate and plant fossils and their sensitivity to adverse impacts. This classification is applied to a geologic formation, member, or other distinguishable unit. This classification system recognizes that although significant fossil localities may occasionally occur in a geologic unit, a few widely spaced localities do not necessarily indicate a higher class. The primary purpose of the PFYC is to assess the possible impacts from surface disturbing activities and help determine the need for pre-disturbance surveys and monitoring during construction.

The project area is situated in the Green River Formation and the Wasatch Formation of the Piceance Creek Basin. These formations are ranked under the PFYC system as class 3b/4b formations. In Class 3b, units exhibit geologic features and preservational conditions that suggest significant fossils could be present, but little information about the paleontological resources of the unit or the area is known. In Class 4b units have high potential of occurrences but have lowered risks of disturbance due to moderating circumstances such as a protective layer of soil or alluvial material; or outcrop areas are smaller than two contiguous acres. In Class 3 units, fossil content varies in significance, abundance, and predictable occurrence. In Class 4 units, vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur but may vary in occurrence and predictability.

A paleontological field survey was conducted in August 2011 (Inter-Mountain Paleo Consulting 2011). The survey report noted that the project area is heavily vegetated in grasses, scrub oak, and non-contiguous pinyon-juniper. Geologic and topographic maps published by the U.S. Geological Survey (USGS) were also reviewed, as was the BLM paleontology database, which indicates known fossil deposits in this area. From approximately MPs 1 to 1.5, bedrock outcrops were sporadic, with some outcrops of fine to coarse-grained, brown and tan sandstones occurring in the surveyed area. Some of these sandstones were conglomeratic, with lenses of mudstone clasts. Some sandstone also exhibited thin, planar, trough cross-bedding. Basalt boulder, pebbles, and boulders were abundant throughout most of the surveyed areas, but no source of the basalt was identified.

The proposed borehole location is on a relatively flat area, above the bluffs overlooking the Colorado River. This area has a slight slope to the west before reaching the cliff. The area is comprised of a light-gray to white shale or claystone, with a few clasts of siltstone on the surface. The cliff area was inaccessible due to the steep grade; however, it appears to be comprised of white to gray shales and siltstones. The area then transitions into the modern floodplain of the Colorado River, and it is comprised of two small terraces of white clay deposits. The floodplain also includes the Union Pacific railroad line and I-70. After the pipeline crosses US 6 on the north side of I-70, it would surface in a light tan mudstone up to the Rifle Compressor Station. These sediments appear to be an upper terrace of the Colorado River.

Surficial fossils were rare along the proposed ROW, with only a few observations of invertebrate trace fossils and a possible woody plant impression having been observed; however, the Green River and the Wasatch Formations are known for their rich fossil content.

Environmental Consequences

Proposed Action

Construction of the proposed Pumba Pipeline has the potential to adversely affect scientifically important fossils. Both surface and subsurface fossils could be damaged or destroyed. The greatest potential for impacts is associated with excavation of surficial materials and shallow bedrock. A BLM-permitted paleontologist would be required to be present to monitor construction activities around MP 9, where a significant outcrop was identified. This recommendation and the standard paleontological COA are included in Appendix A.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting fossil resources are anticipated.

3.5 Geology and Minerals

Affected Environment

The project area is located within the southern Piceance Basin, a broad, elongate structural basin located in the eastern portion of the Colorado Plateau. The basin is highly asymmetrical and deepest along its eastern side near the White River Uplift, where more than 20,000 feet of sedimentary rocks are present. Surface exposures in the Piceance Basin are primarily sedimentary rocks of the Green River and Wasatch Formations.

The youngest rocks in the area are unconsolidated sedimentary surficial deposits of Quaternary age. The proposed pipeline would traverse landslide deposits, areas of alluvium, and portions of the Wasatch (Ohio Creek equivalent) formation. The proposed bore avoids areas with older gravels and alluviums and landslide deposits. These geologic formations and their relevant characteristics are listed in Table 4.

Table 4. Surficial Geologic Formations in the Pumba Pipeline Project Area				
<i>Map Symbol</i>	<i>Formation Name</i>	<i>Age</i>	<i>Characteristics</i>	<i>Location</i>
Qa	Modern alluvium	Holocene	Gravel, sand, and silt	Stream valleys and alluvial fans
Qg	Gravels and alluviums	Pleistocene	Young gravels; stream, terrace, and outwash gravels	Stream valleys and alluvial fans
Qgo	Older gravels and alluvium	Pleistocene	Terrace, outwash, and pediment deposits	Mesa tops
Ql	Landslide deposits	Pleistocene and Holocene	Heterogeneous rapid gravity flow deposits of clay-to-boulder-sized materials	Mesa sideslopes
Two	Wasatch and Ohio Creek Formations	Eocene and Paleocene	Claystone, shale, siltstone, sandstone, bedrock	Outcrops on mesa tops and sideslopes
Source: Tweto 1979				

The area encompassing the proposed pipeline corridor is located primarily south of the Colorado River although the initiation point is the meadow south of the Rifle compressor station, at an elevation of approximately 5,200 feet above mean sea level. Elevations range from that low point to approximately 7,200 feet around the moderate slopes of Flatiron Mesa and decrease again on the east side of Grass Mesa toward the East Mamm compressor station. Slopes range from less than 1% to more than 30% in steepness.

Limited amounts of salable mineral resources are located within the project area. These include sand and gravel in Quaternary deposits along stream valleys and in terrace deposits on mesa tops. According to the Colorado Geological Survey (CGS 1999), these deposits are of little commercial value because the gravels contain abundant silt and clay matrix and secondary calcium carbonate cements.

Environmental Consequences

Proposed Action

The Proposed Action would result in removal of surface materials and excavation of subsurface materials along the proposed corridor. Extraction and displacement of sedimentary rocks would occur. The project would result in minimal effect on geologic resources and no effect on economic mineral resources.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting geologic resources are anticipated.

3.6 Invasive Non-Native Species

Affected Environment

Noxious weed inventories were conducted along the proposed pipeline corridors in the summer and fall of 2011 (Pettersen 2011). Because the ROW also parallels a number of existing ROWs and existing roads, existing surface disturbances are present in the general area. These previous disturbances have resulted in some populations of State-listed noxious weeds, including scattered musk thistle (*Carduus nutans*), plumeless thistle (*C. acanthoides*), and Scotch thistle (*Onopordum acanthium*) along the existing roads and ROWs and in existing plant communities in the vicinity of the proposed ROW.

Also present are Canada thistle (*Cirsium arvense*) in more mesic sites and scattered Japanese brome (*Bromus japonicus*) occurring intermittently. An infestation of diffuse knapweed (*Centaurea diffusa*) was observed in one area west of the Pumba compressor station. Other State-listed noxious weeds in the area include oxeye daisy (*Chrysanthemum leucanthemum*), yellow toadflax (*Linaria vulgaris*), and houndstongue (*Cynoglossum officinale*). Cover by noxious weeds in the area was less than 1% of the total plant cover.

Environmental Consequences

Proposed Action

The Proposed Action includes approximately 96.5 acres of surface disturbance, of which 49.9 acres would be on BLM-administered Federal land. Adherence to standard surface-use COAs (Appendix A) would minimize the spread of invasive non-native species and reduce impacts from these species on other natural resources.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting invasive non-native plants are anticipated.

Analysis on Public Land Health Standard 3 or Plant and Animal Communities

With implementation of weed management requirements, the Proposed Action would not jeopardize the viability of any plant population as a result of the proliferation of invasive non-native species. The project would have no significant consequence on habitat condition, utility, or function or have any discernible effect on species abundance or distribution at any landscape scale. The Rifle-West LHA (BLM 2005) indicated a concern about the amount of pipelines occurring on the landscape and the cumulative impacts to vegetation communities, especially where non-native plant species are used in reclamation or where cheatgrass is invading. This project would contribute to those concerns, but given the proposed use of native species for reclamation and the requirements for weed control and monitoring, Public Land Health Standard 3 would continue to be met.

3.7 Migratory Birds

Affected Environment

The Migratory Bird Treaty Act (MBTA) includes guidance for the protection of native passerines (flycatchers and songbirds) as well as birds of prey, migratory waterbirds (waterfowl, wading birds, and shorebirds), and other species such as doves, hummingbirds, swifts, and woodpeckers. Within the context of the MBTA, “migratory” birds include non-migratory “resident” species as well as true migrants, essentially encompassing most native bird species. The nesting time period is of special importance as the ability to create a nest, incubate, and rear chicks to fledging is a vulnerable time period for birds, and disturbances to nesting activities can lead to larger consequences for individual birds. In addition, because birds are generally territorial during the nesting season, their ability to access and utilize sufficient food is limited by the quality and availability of the territory occupied. During non-breeding seasons, birds are generally non-territorial and able to feed across a larger area and wider range of habitats.

The U.S. Fish and Wildlife Service (USFWS) has published a list of Birds of Conservation Concern (BCC) that warrant prompt conservation attention to stabilize or increase populations or to secure threatened habitats (USFWS 2008); therefore, this analysis focuses on BCC species, as well as two other groups—raptors and Neotropical (long-distance) migrants—that are particularly vulnerable to habitat loss or modification on their breeding grounds.

BCC species potentially present in the portion of the CRVFO area that includes the proposed pipeline, based on habitat preferences and known geographic ranges, are the bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), flammulated owl (*Otus flammeolus*), Lewis's woodpecker (*Melanerpes lewis*), willow flycatcher (*Empidonax traillii*), gray vireo (*Vireo vicinior*), pinyon jay (*Gymnorhinus cyanocephalus*), juniper titmouse (*Baeolophus griseus*), Brewer's sparrow (*Spizella breweri*), and Cassin's finch (*Carpodacus cassinii*). Among these, the bald eagle is also listed as a BLM sensitive species in Colorado and is covered in the section on Special Status Species. The golden eagle hunts primarily over large expanses of unwooded habitat and nests on cliffs, which are not present in the project area. Habitat associations of these species and other raptors or Neotropical migrants potentially nesting in the project area include the following:

Pinyon-Juniper Woodlands – This habitat type provides cover, food, and nesting habitat for a variety of migratory birds. BCC species associated with pinyon-juniper habitats during the nesting season include the flammulated owl pinyon jay, juniper titmouse, and gray vireo, the latter two generally farther west than the CRVFO area. Another BCC species, Cassin's finch, nests in higher elevation conifers but is a winter visitor in pinyon-juniper. Non-BCC migrants include the plumbeous vireo (*Vireo plumbeus*), blue-gray gnatcatcher (*Polioptila caerulea*), American robin (*Turdus migratorius*), mountain and western bluebirds (*Sialia currucoides*, *S. mexicanus*), black-throated gray warbler (*Dendroica nigrescens*), Virginia's warbler (*Oreothlypis virginiae*), and lark sparrow (*Chondestes grammacus*).

Raptors potentially nesting in pinyon-juniper habitats in addition to the flammulated owl include the red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk (*B. swainsoni*), Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*A. striatus*), American kestrel (*Falco sparverius*), and northern pygmy-owl (*Glaucidium gnoma*).

Mixed Mountain Shrublands – The vegetation of mixed mountain shrublands varies substantially depending on elevation, slope, aspect, and soil. More mesic (moist) sites such as on north-facing slopes and along minor drainageways are typically dominated by Gambel's oak and serviceberry, while more xeric (dry) sites such as south-facing slopes are typically dominated by mountain-mahogany, bitterbrush,

snowberry, and sagebrush. Other passerines in this habitat type include the dusky flycatcher (*Empidonax oberholseri*), western scrub-jay (*Aphelocoma californica*), lazuli bunting (*Passerina amoena*), lesser goldfinch (*Carduelis psaltria*), black-headed grosbeak (*Pheucticus melanocephalus*), and spotted towhee (*Pipilo maculatus*).

Sagebrush Shrublands – The sagebrush shrubland habitat type, like the mixed mountain shrubland type, varies considerably depending on elevation, slope, aspect, and soil. Extensive stands of sagebrush provide cover, food, and nesting habitat for one BCC species, Brewer’s sparrow. Three other migrants—the Say’s phoebe (*Sayornis saya*), western kingbird (*Tyrannus verticalis*), and vesper sparrow (*Pooecetes gramineus*)—are relatively common in this type and also occur in sparse pinyon-juniper or grassland types. The western meadowlark (*Sturnella neglecta*) may also nest in sagebrush. In addition to providing hunting habitat for the golden eagle, red-tailed hawk, Swainson’s hawk, and American kestrel, sagebrush shrublands may be used for breeding by the ground-nesting northern harrier (*Circus cyaneus*).

Riparian Woodlands and Shrublands – Bird species found in riparian habitats in the CRVFO area include three BCC species: the bald eagle and Lewis’s woodpecker primarily in mature cottonwoods along the Colorado River, and the willow flycatcher primarily in dense stands of tall willows along tributary streams. Lewis’s woodpecker is seldom found as far east as the CRVFO area. The subspecies of willow flycatcher in the CRVFO area is distinct from the subspecies (southwestern willow flycatcher) that is a candidate for Federal listing.

Non-BCC migrants nesting along streams in the CRVFO area include the cordilleran flycatcher (*Empidonax occidentalis*), warbling vireo (*Vireo gilvus*), house wren (*Troglodytes aedon*), Bullock’s oriole (*Icterus bullockii*), yellow warbler (*Dendroica petechia*), and American goldfinch (*Carduelis tristis*) in cottonwood woodlands and the willow flycatcher (*Empidonax traillii*) and song sparrow (*Melospiza melodia*) in willow shrublands. Raptors commonly associated with cottonwood woodlands include the red-tailed, Cooper’s, and sharp-shinned hawks, the great horned owl (*Bubo virginiana*), and the long-eared owl (*Asio otus*).

Environmental Consequences

Proposed Action

Direct impacts to migratory birds from the Proposed Action include the loss of approximately 96.5 acres of vegetation. Riparian vegetation/habitats along the Colorado River would be avoided due to boring the area. The 18 acres of mixed mountain shrubland and 42 acres of pinyon-juniper woodland to be removed by the pipeline construction activities would take many decades or longer return to pre-construction conditions. This could displace some BCC and other migratory birds over the life of the project. However, the loss habitat along a narrow strip of which more than half is already a pipeline corridor would be less impactful in terms of both habitat loss and habitat fragmentation than an equal area of impact in a more equably shaped area. It is unlikely that the Proposed Action would directly affect vegetation suitable for nesting raptors. Therefore, while habitat loss and associated habitat fragmentation may affect a small number of individual migratory or resident birds, these impacts would be insignificant at the population or species levels.

Construction activities during the nesting season could result in the destruction of active nests, including any eggs or young within the nests. The COA for BCC species would prevent the destruction of nests since it would prohibit surface-disturbing activities in suitable habitat from May 1 to July 1 (Appendix A). Additionally, visual and noise disturbance near active nests could indirectly impact these species causing nest abandonment, nest failure, or reduced productivity. To reduce these potential impacts, raptor surveys would be conducted to identify active nests.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting migratory birds are anticipated.

3.8 Native American Religious Concerns

Affected Environment

At present, no Native American concerns are known within the project area. However, because some potentially sensitive areas were identified, the BLM consulted with relevant tribes. Letters with descriptions of the proposed project and its location were sent to the Ute Tribe (Uintah & Ouray Bands), Southern Ute Tribe, and the Ute Mountain Ute Tribe on January 30, 2012 with a request that upon receipt of the letter, it be made available and distributed to all interested persons, groups and traditional leaders for comments, with any responses requested within 30 days. No responses were received.

Environmental Consequences

Proposed Action

Because some sensitive areas were identified, the BLM consulted with relevant tribes. No responses were received. Indirect, long-term cumulative impacts from increased access and the presence of project personnel could result in a range of impacts to known and undiscovered cultural resources in the vicinity of the project location. These could range from accidental damage or vandalism to illegal collection and excavation.

The National Historic Preservation Act (NHPA) requires that if newly discovered cultural resources are identified during project implementation, work in that area must stop and the agency BLM notified immediately (36 CFR 800.13). The Native American Graves Protection and Repatriation Act (NAGPRA), requires that if inadvertent discovery of Native American Remains or Objects occurs, activity must cease in the area of discovery, a reasonable effort made to protect the item(s) discovered, and immediate notice made to the agency BLM, as well as the appropriate Native American group(s) (IV.C.2). Notice may be followed by a 30-day delay (NAGPRA Section 3(d)). Further actions also require compliance under the provisions of NHPA and the Archaeological Resource Protection Act.

Encana will notify its staff and contractors of the requirement under the NHPA, that work must cease if cultural resources are found during project operations. A standard Education/Discovery COA for the protection of cultural resources and Native American values would be attached to the permit. The importance of these COAs would be stressed to the operator and its contractors, including informing them of their responsibilities to protect and report any cultural resources encountered. The proponent and contractors should also be aware of requirements under the NAGPRA.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting Native American religious concerns are anticipated.

3.9 Noise

Affected Environment

Noise is generally described as unwanted sound. Weighted noise intensity (or loudness) is measured as sound pressure in decibels (dBA). Each 20-unit increase in the decibel scale increases the sound loudness by a factor of 10.

Sound levels have been calculated for areas that exhibit typical land uses and population densities. In rural recreational and agricultural lands, ambient sound levels are expected to be approximately 30 to 40 dBA (EPA 1974, Harris 1991). These typical noise levels result primarily from equipment operations during ranching and farming activities and vehicular traffic on rural roads. In comparison, the noise level during normal conversation of two people 5 feet apart is approximately 60 dBA.

Oil and gas activities are subject to noise abatement procedures as defined in the COGCC Rules and Regulations (Aesthetic & Noise Control Regulations). Operations involving installation or maintenance of pipelines or gas facilities are subject to the maximum permissible noise levels for industrial zones, set at 70 dBA from 7:00 a.m. to 7:00 p.m. and 65 dBA from 7:00 p.m. to 7:00 a.m. The permissible noise levels are as measured at a distance of 350 feet from the source. Periodically, noise levels may increase by up to 10 dBA above levels for no more than 15 minutes in a 1-hour period.

Environmental Consequences

Proposed Action

Construction and traffic noise would be elevated as a consequence of the Proposed Action. The greatest increase would be along access roads, operation of equipment at material staging areas, and the pipeline alignment during trenching, pipe placement, backfilling/recontouring, and seedbed preparation. Based on the data summarized in Table 5, approximately 60 to 69 dBA at 500 feet and 54 to 63 dBA at 1,000 feet would be created by the project. These levels approximate active commercial areas (EPA 1974).

Table 5. Noise Levels at Typical Construction Sites and along Access Roads			
<i>Equipment</i>	<i>Noise Level (dBA)</i>		
	<i>50 feet</i>	<i>500 feet</i>	<i>1,000 feet</i>
Air Compressor, Concrete Pump	82	62	56
Backhoe	85	65	59
Bulldozer	89	69	63
Crane	88	68	62
Front End Loader	83	63	57
Heavy Truck	88	68	62
Motor Grader	88	65	59
Road Scraper	87	67	61
Tractor, Vibrator/Roller	80	60	54
Sources: BLM (1999a), La Plata County (2002)			

Although the project would have a total duration of approximately 6 months, the work would gradually shift along the 11.2-mile length of the corridor. Main access roads used for travel to/from the construction areas would receive the most protracted increases in noise levels.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting noise levels are anticipated.

3.10 Range Management

Affected Environment

The proposed pipeline route would be located on two BLM grazing allotments. The grazing permits are small ranching operations, typically cow-calf operations and are highly dependent on the forage resources in the allotments for spring, summer, and fall feeding. Livestock management practices are limited to the permitted season of use and restrictions on the number and kind of livestock allowed. Both the Grass Mesa and Beaver Mamm allotments have use periods that begin in May for the lower elevation areas. Livestock are rotated to higher elevations as the summer progresses. Table 6 summarizes the permitted grazing use on each BLM allotment. Rangeland improvements that could be affected by the project include fences and stock watering sources.

Table 6. BLM Grazing Allotments in the Project Area					
<i>Authorization</i>	<i>Allotment Name and Number</i>	<i>Livestock Kind and Number</i>	<i>Season of Use</i>	<i>Percent Federal</i>	<i>AUMs</i>
0500001	Beaver Mamm #08104	Cattle 79	5/15 – 10/15	100%	400
0503869	Beaver Mamm #08104	Cattle 45	5/15 – 10/15	100%	228
0507561	Grass Mesa #08112 Lower Pasture	Cattle 32	5/15 – 6/30	100%	49
	Grass Mesa #08112 Upper Pasture	Cattle 40	7/1 – 8/15	15%	9
<p><i>*Animal Unit Months (AUMs) are defined as the amount of forage needed by an animal unit (AU) grazing for one month. An AU is defined as one mature 1,000 pound cow and her suckling calf.</i></p>					

Environmental Consequences

Proposed Action

Surface-disturbing activities associated with pipeline construction would result in the initial loss of approximately 1.2 animal unit months (AUMs) of forage on the Grass Mesa allotment and 5.5 AUMs on the Beaver-Mamm allotment, increased human activities for the short-term, and the potential spread of noxious weeds and other invasive non-native species. The forage loss would persist until successful reclamation of disturbed areas occurred. On areas that are disturbed and rehabilitated, herbaceous vegetation and herbaceous forage production typically recovers to pre-disturbance levels in approximately three to 5 years depending on moisture conditions. It is anticipated that the level of impacts from implementation of the Proposed Action would not require the adjustment of stocking rates. The level of forage utilization would be monitored on affected allotments and, if necessary, adjustments in livestock use would be made to protect land health. An increase in human activity related to construction and maintenance of the Proposed Action would cause cattle to move away from locations where construction is taking place. The negative impact that an increase in human activity would have on grazing livestock would be expected to be minor.

Effects of increased human activity and construction equipment also could increase the introduction and spread of noxious weeds and the subsequent degradation of rangeland health. See the section on Invasive Non-Native Species for a detailed discussion of the effects of these plants and of mitigation measures related to the Proposed Action.

Removal of allotment fences and cattle guards during pipeline construction could allow cattle to escape their pastures and drift onto other pastures and/or allotments. The open trench could present a hazard to livestock and limit movement within the allotment. Best management practices (including constructing trenches with natural egress ramp in the trench) and conditions of approval (including repairing or replacing any range improvements impacted by construction) would mitigate impacts to the allotments or the cattle they support.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting livestock grazing are anticipated.

3.11 Realty Authorizations

Affected Environment

Table 7 lists existing Federal realty authorizations (right-of-way grants) affecting BLM lands within the boundaries of the Proposed Action (Table 7).

Table 7. Existing Realty Authorizations in Project Area			
<i>Electrical Powerlines</i>	<i>Access Roads</i>	<i>Natural Gas Pipelines</i>	<i>Water Pipelines</i>
Township 6 South, Range 93 West, Sections 29, 30, 32, 34, and 35, Sixth Principal Meridian (PM)			
COC29423 - PSC COC58919 - Benjamin COC65341 - PSC COC66361 - PSC COC030996 - PSC	COC53838 - Benjamin COC65904 - Encana COC72164 - Laramie COC73020 - Laramie	COC59787 - Williams COC66794 - Encana COC67129 - Encana COC70219 - ETC COC72164A - Laramie COC73018 - ETC COC73019 - Laramie COC74637 - Encana COC051718 - Seas Oil	*COC20070 - BLM COC40235 - Encana COC67521 - Encana COC71208 - Petrogulf COC7301801 - Laramie COC74134 - Laramie COC74577 - Encana
Township 7 South, Range 93 West, Sections 3, 4, 5, 9, and 10, Sixth PM			
COC29423 - PSC COC66361 - PSC		COC66459 - Encana COC66794 - Encana COC67129 - Encana COC73824 - ETC COC74837 - ETC	COC67521 - Encana COC74857 - Encana COC74858 - Encana
Township 6 South, Range 94 West, Section 24, Sixth PM			
		COC51003 - ETC COC54361 - PSC COC57043 - Encana COC66794 - Encana COC051718 - Seas Oil	

Environmental Consequences

Proposed Action

Under the Proposed Action, ROW authorizations would be granted subject to appropriate terms and conditions. These authorizations would provide Encana legal access for the installation of the proposed pipeline. Standard BLM reclamation requirements would apply. These grants would include a permanent (30-year) right-of-way and an adjacent Temporary Use Permit (TUP) with a 2-year duration to provide adequate construction workspace during all phases of construction.

The proposed Pumba Pipeline would be constructed in parallel alignment with or adjacent to portions of the following reclaimed gas gathering pipelines on BLM lands:

Township 6 South, Range 93 West

- 2.4 miles of Encana natural gas pipeline (COC 66794) in sections 29, 30, and 32
- 0.8 miles of another Encana natural gas pipeline (COC 67129) in sections 34 and 35

Township 7 South, Range 93 West

- 2.1 miles of Encana natural gas pipeline (COC 66794) in sections 3, 4, 5, 9, and 10
- 0.8 miles of another Encana natural gas pipeline (COC 67129) in sections 9 and 10

Township 6 South, Range 94 West

- 0.7 miles of Encana natural gas pipeline (COC 66794) in section 24
- 0.6 miles of Seas Oil natural gas pipeline (COC 51718) in section 24
- 0.6 miles of ETC natural gas pipeline (COC 51003) in section 24
- 0.5 miles of PSC natural gas pipeline (COC 54361) in section 24

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting other existing Right-of-Way Grants or other realty actions are anticipated.

3.12 Recreation

Affected Environment

The scattered parcels of BLM public lands within the project area are part of the Glenwood Springs extensive recreation management area (ERMA) in which management is for dispersed, undirected recreation activities. The RMP does not have any specific, measurable or targeted recreation management objectives for ERMA's.

BLM's general recreation management responsibility in ERMA's is to "take care of" dispersed recreation activities, visitor safety, use and user conflicts, and resource protection issues. Management direction for the CRVFO to "provide visitor information, minimal sanitation facilities and access ... [and to] manage ERMA's to resolve management issues and for off-road [vehicle] (ORV) use" (BLM 1984).

The project area is located within the Roaded Natural Recreation Opportunity Spectrum (ROS) class, which is characterized by a generally natural environment with moderate evidence of the sights and

sounds of man. Resource modification and use practices are evident but harmonize with the natural environment and provide opportunities for (1) either affiliation with other user groups or isolation from the sights and sounds of man, (2) a high degree of interaction with the natural environment, (3) practicing outdoor skills, and (4) both motorized and non-motorized recreation.

The landscape of the area appears generally natural; however, there are existing vehicle routes and evidence of oil and gas development in the area (pipeline rights-of-way and surface facilities including compressor station). A portion of the pipeline passes through and parallels the Grass Mesa subdivision. The level of visitor management and regulation is low, but it does increase during hunting season. Big-game hunting is the most popular activity in the area. As a dispersed recreational activity, hunting is not limited to specific areas. No developed recreational facilities such as campgrounds, picnic areas, and maintained hiking/biking trails are located within the project area. Off-highway vehicle use is limited to existing roads and trails year round; except for snowmobiles operating on snow.

The project area supports big-game hunting. Several outfitters currently hold BLM permits to provide guiding and outfitting services to big-game hunters in the project vicinity.

Environmental Consequences

Proposed Action

Changes in the physical, social and administrative setting characteristics of the recreation setting resulting from implementation of the proposed action would likely displace traditional users who enjoy participating in dispersed recreation activities in the project area. The ROW clearing and pipeline construction would occur from May through November and would likely affect the big game outfitters and their patrons especially from August through November. The associated traffic, noise, and dust along the access route, would likely make the area less attractive, or unattractive, to hunters. The permitted outfitters could potentially suffer a loss of business, although the total size of the project is relatively small compared to the overall area that would remain available for guided hunting.

To minimize impacts to visitors, public notices would be posted by the operator at all main access and entry areas and along major travel corridors. Notices would include when the project is occurring (starting and end date), why the project is being done, who is doing it, where (map), and what is being done. When practicable, construction activities would be scheduled to avoid high-use seasons, such as the fall big-game hunting season. Special Recreation Permit (SRP) holders affected by the proposal would be notified of the project. Traffic control and signage would be implemented as necessary.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting recreation are anticipated.

3.13 Riparian and Wetland Areas

Affected Environment

Riparian and wetland surveys and jurisdictional determinations for Waters of the U.S. were performed for Encana by Rocky Mountain Ecological Service (RMES) in fall 2011. These surveys were conducted as outlined in the *2006 Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*. Waters of the U.S. are surface waters that are, or contribute flow to,

navigable waters and thus within the jurisdiction of the U.S. Army Corps of Engineers (USACE) pursuant to Section 404 of the Clean Water Act. Jurisdictional wetlands are areas that meet the definition for wetlands based on vegetation, hydrology and soils and are connected hydrologically to Waters of the U.S.

The surveys identified wetlands in four general locations:

- Adjacent to the Union Pacific Railroad right-of-way north of the river.
- On the Colorado River floodplain overlying the area of the proposed bore beneath the river.
- Where the pipeline would cross Helmer Gulch approximately 3 miles southwest of Rifle.

At the northern end of the bore site, irrigation return flows ponding up against the railroad grade support small areas of three wetland indicator species: broadleaf cattail (*Typha latifolia*), giant reed (*Phragmites australis*), and coyote willow (*Salix exigua*). These wetland areas would not be impacted by the bore. The same is true for the Colorado River riparian corridor, dominated by non-native tamarisk (salt-cedar) (*Tamarix* spp.) above the bore, and for small patches of wetland vegetation on the north-facing sideslopes of Taughenbaugh Mesa south of the river. These small areas and numerous cottonwood (*Populus* spp.) trees are interspersed among the dominant junipers and upland shrubs and apparently sustained by shallow subsurface moisture, including moisture originating as agricultural on the flat top of Taughenbaugh Mesa.

The only wetlands potentially affected by the project are along the floor of Helmer Gulch, an ephemeral stream with localized areas of persistent subsurface moisture along the channel floor. In the vicinity of the proposed open-trench crossing of Helmer Gulch, the channel floor is mostly upland grasses and weedy forbs, but the localized moist areas support patches of wetland indicator species such as cattails (*Typha* sp.), brookgrass (*Catabrosa aquatica*), Baltic rush (*Juncus balticus*), and western dock (*Rumex aquatilis* ssp. *occidentalis*). The actual crossing point would be adjacent to an existing pipeline crossing with a broader, less incised channel. Vegetation shifts abruptly from hydrophytic (wet-site) and mesophytic (moist-site) plants to xeriphytic (dry-site) species a short distance above the channel floor. The entire area of the proposed crossing shows extensive damage by livestock, drawn to the relatively lush forage and periodic surface water for drinking.

Although not supporting riparian or wetland vegetation, several minor ephemeral drainages to be crossed by the pipeline are considered Waters of the U.S. because they connect, in a downstream direction, with progressively larger drainages and eventually perennial streams. All are tributary to the Colorado River.

Environmental Consequences

Proposed Action

The pipeline would be bored beneath the Colorado River, with both the northern and southern terminus sites located outside the riparian corridor and associated or isolated wetland areas. Additionally, the proposed bore alignment would cross beneath the adjacent riparian corridor in an area dominated by non-native tamarisk, a State-listed noxious weed. For these reasons, and the proposed depth of the bore beneath the river and adjacent terrace slopes, no impacts to riverine or isolated hillside wetlands would be expected.

No other perennial streams would be crossed by the pipeline, although the proposed alignment shows crossings of a number of ephemeral drainages that, while not supporting wetland or riparian habitat, are considered Waters of the U.S. Direct impacts at these crossings of these ephemeral drainages would consist of temporary disturbance of the drainage floor and sideslopes, to be recontoured and revegetated

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

The proposed open-trench crossing of Helmer Gulch would result in approximately 0.01 acre of direct impact to jurisdictional wetlands along the stream channel. Construction across Helmer Gulch would not occur during periods of flow (see Appendix A), and BMPs would be installed to minimize the downstream transport of sediments from the working area. Because of the naturally sediment-rich environment of the Helmer Gulch channel and the currently degraded habitat due to heavy use by cattle, disturbance of the channel floor by the proposed open-trench crossing would not be expected to have significant adverse impacts to downstream reaches. The slightly elevated moisture along the channel floor in the area of the crossing is expected to result in relatively rapid reestablishment of seeded species used in revegetation or volunteering from adjacent and upstream reaches.

A potential adverse impact associated with work within or near drainage channels is the accidental release of diesel fuel, lubricants, and other liquids from the operation of heavy equipment. The potential for this is small, and construction when drainages are not flowing (Appendix A) would minimize the risk of downstream transport of these compounds.

Over the long term, leakage from the pipeline where it crosses drainages is a possible source of contamination. Again, however, this is a very low probability event, and pipeline design includes cutoffs to minimize the volume of released material in the event of a breach. The Pumba Pipeline would be pressure tested to detect leakage prior to use being put into operation.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting riparian and wetland resources are anticipated.

Analysis on Public Land Health Standard 2 for Riparian Systems

The Divide Creek LHA conducted in 2009 determined that all 19 lotic (stream) areas assessed were meeting Standard 2 for healthy riparian areas. The West-Rifle LHA conducted in 2004 determined that most of the 20 areas assessed were meeting Standard 2 for healthy riparian areas, with the exception of the lower reaches of Cottonwood Gulch and Riley Gulch, both of which are outside of this project area. The Pumba Pipeline would not directly affect any perennial streams but would directly affect less than 0.1 acre of wetlands along Helmer Gulch and would cross 20 dry drainages classified as Waters of the U.S., with a total of approximately 2,074 linear feet of pipeline length among these 20 crossing. Based on the above, and the COAs presented in Appendix A for the protection of surface waters, the Proposed Action would not affect surface waters or riparian/wetland areas from meeting Public Land Health Standard 2.

3.13 Socio-Economics

Affected Environment

The project area is located within Garfield County, Colorado. The county seat is in Glenwood Springs, other towns include Carbondale, New Castle, Silt, Rifle, Parachute, and Battlement Mesa. Highway I-70 transects the length of the county; a network of County and private roads service the project area.

The population of Garfield County grew by an average of approximately 3% per year from 2005 to 2010, resulting in an increase from 49,259 to 56,389 residents (DOLA 2010). Population growth in Garfield County is expected to more than double over the next 25 years to 112,683 in 2035 (DOLA 2011a). In 2010, industry groups in Garfield County with the highest percentage of total employment were construction 19%, education and health 16.5%, retail trade 14%, and arts, entertainment and recreation (including tourism) 12%. Employment in agriculture, forestry, hunting, and mining accounted for just over 3% of total employment (USCB 2010c).

Personal income in Garfield County has also risen, growing from \$504 million in 1990 to \$2.1 billion in 2009. Annual per capita income has grown in the same period; from \$19,354 to \$37,099 in 2009, though per capita income did decrease 8% between 2007 and 2009 (USDC 2011). The communities of Parachute, Silt, and Rifle are the most affordable for housing, while Battlement Mesa, New Castle, and Glenwood Springs are the least affordable, with the cost to rent or own similar housing 50% higher or more (BLM 2006).

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

Growth of the oil and gas industry has been increasingly important to local economies (BLM 2006). Production of natural gas in Garfield County has increased from 70,309,038 Thousand Cubic Feet (MCF) in 2000 to 499,259,791 (MCF) in 2011 (COGCC 2011b). In addition, more than 1800 drilling permits were approved in 2011 (COGCC 2011a) for Garfield County. While the number of workers employed in the mining and extraction industry in Garfield County is only about 3.4% of the total workforce (USCB 2010c), this number is misleading because some oil and gas employment has been incorporated as part of the construction sector statistics instead (BLM 2006).

The Federal government makes “Payments in Lieu of Taxes” (PILT) to County governments to help offset property tax revenue lost on nontaxable Federal lands within County boundaries (BLM 2006). The PILT distributions are based on acres for all Federal land management agencies (e.g., approximately 1.9 million acres in Garfield County). The amount may also be adjusted based on population and as appropriated by Congress. By formula, payments are decreased as other Federal funds, such as mineral royalty payments, increase. Table 8 shows PILT received by Garfield County in the last 5 (USDI 2011).

Table 8. Federal Payments in Lieu of Taxes to Garfield County	
<i>Year</i>	<i>PILT Amounts</i>
2011	\$391,032
2010	\$391,649
2009	\$1,808,984
2008	\$654,453
2007	\$1,078,087

In addition to PILT payments, BLM shares revenue generated by commercial activities on public lands with state and county governments (BLM 2006). Federal mineral royalties are collected on oil and gas production from Federal mineral leases. Oil and gas lessees pay royalties equal to 12.5% of the wellhead value of oil and gas produced from public land. Half of the royalty receipts are distributed to Colorado; the amount distributed to Garfield County in Federal royalties and state severance direct distributions was \$5.9 million in 2011. These funds are then allocated to fund County services, schools, and local communities (DOLA 2011b).

Property tax revenue from oil and gas development is the largest source of public revenue in Garfield County. In 2011, oil and gas assessed valuation in Garfield County amounted to approximately \$2.7 billion, 68% of total assessed value. Total revenues from property taxes and special district levies were \$164 million. Tax dollar distributions in 2009 were Schools 34%, County 31%, Special Districts 13%, Fire Districts 11%, Colleges 8%, and Towns 2% (Garfield County 2011).

The NEPA process requires a review of the environmental justice issues as established by Executive Order 12898 (February 11, 1994). The order established that each Federal agency identify any “disproportionately high and adverse human health or environment effects of its programs, policies, and activities on minority and low-income populations.” The Hispanic/Latino community is the only minority population of note in the vicinity of the project area. In 2010, 28.3% of the residents of Garfield County identified themselves as Hispanic or Latino (USCB 2010b), which is slightly higher than the state’s 20.7% Latino population (USCB 2010a). African Americans, Asians Americans, Native Americans, and Pacific Islanders account for less than 3% each of the Garfield County population, which is below the state average (USCB 2010b).

Environmental Consequences

Proposed Action

The Proposed Action would positively impact the local economy of Garfield County through the creation or retention of jobs in the oil and gas industry and in supporting trades and services. Some minor economic loss to permitted outfitter and guide operators may result from the potential displacement of big game, resulting reduction in big game hunting within the project area, and shortened hunting seasons for the next two years. This is not anticipated to be a long-term economic impact. The Proposed Action could result in negative social impacts, including a change in the recreational opportunities, reduced scenic quality, increased levels of fugitive dust, and increased traffic volumes. BMPs would be used to minimize these negative impacts.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, little if any expansion of job opportunities would occur except as related to the general population growth of the region, which has slowed in recent years due to the general economic downturn.

3.15 Soils

Affected Environment

The proposed Pumba Pipeline alignment would generally traverse nearly level to moderate slopes, ranging from less than 1% on valley floors to approximately 30% on hillsides and mesa slopes. Fourteen soil types would be crossed by the pipeline (Table 9) based on the *Soil Survey of Rifle Area, Colorado*:

Parts of Garfield and Mesa Counties (USDA 1985). As shown in the table, 30% of the proposed alignment is on soils with an erosion hazard of “moderate to severe” or “severe.” However, the bulk of these soils consist of two soil types on slopes of up to 70%, while the pipeline alignment does not exceed a slope 30%, except for a bore from the top of Taughenbaugh Mesa to beneath the Colorado River.

Table 9. Soil Types and Characteristics Affected by the Proposed Action		
<i>Soil Type*</i>	<i>Description</i>	<i>% of ROW</i>
Morval-Tridell complex (6-25% slopes)	Found on alluvial fans and the sides of mesas at elevations ranging from 6,500 to 8,000 feet. Both soils are deep, well drained, and have medium surface runoff and moderate erosion hazard.	19
Olney loam (6-12% slopes)	Found on alluvial fans and sides of valleys at elevations ranging from 5,000 to 6,500 feet. Parent material is sandstone and shale. Erosion hazard is moderate, and surface runoff is medium.	16
Torriothents-Rock outcrop, steep (15-70% slopes)	Stony soils and exposed outcrops of Mesaverde sandstone and Wasatch shale. The Torriothents are clayey to loamy and contain gravel, cobbles, and stones, many of which are basaltic in origin. Found on mountainsides below the Rock outcrop. Erosion hazard varies from moderate to severe.	16
Potts-Ildefonso complex (12-25% slopes)	Found on mesas, alluvial fans, and the sides of valleys at elevations ranging from 5,000 to 6,500 feet. Parent material consists of sandstone, shale, and basalt. Surface runoff and erosion hazard are moderate.	11
Potts loam (3 to 6% slopes)	Found on mesas, benches, and the sides of valleys at elevations ranging from 5,000 to 7,000 feet. Parent material includes sandstone, shale, and basalt. Surface runoff is slow, and the erosion hazard is moderate.	10
Villa Grove-Zoltay loams (15-30% slopes)	Occur on mountainsides and alluvial fans at elevations ranging from 7,500 to 7,600 feet. The Villa Grove has slow surface runoff with slight erosion hazard. The Zoltay soil has medium surface runoff with moderate erosion hazard.	10
Torriothents-Camborthids-Rock outcrop complex (15-70% slopes)	The Camborthids occur on the lower toe slopes on foothills and mountainsides while the Torriothents are found on the foothills and mountainsides below the Rock outcrop. The Torriothents are shallow to moderately deep, and clayey to loamy with gravel, cobbles, and stones. The Camborthids are shallow to deep and clayey to loamy. Rock outcrop primarily consists of Mesaverde sandstones and Wasatch shales with occasional basaltic boulders and stones. Erosion hazard is moderate to severe.	7
Potts loam (6-12% slopes)	Found on mesas, benches, and the sides of valleys at elevations ranging from 5,000 to 7,000 feet. Parent material includes sandstone, shale, and basalt. Surface runoff is medium, and the erosion hazard is severe.	3
Torrifluvents (nearly level)	Deep soil formed in floodplain alluvium. Surface layer ranges from loamy sand to clay loam and underlying layers are sandy to stony loam and clay loam. Supports riparian vegetation; water table is 2 to 4 feet subsurface. Erosion hazard is slight.	3
Arvada loam (1-20% slopes)	Found on fans and high terraces at elevations ranging from 5,100 to 6,200 feet and on slopes. It is derived from sandstone and shale and was formed in saline alluvium. Surface runoff is medium to moderately rapid, and erosion hazard is moderate to severe.	2
Ildefonso stony loam (25-45% slopes)	Found on mesas, sides of valleys, and alluvial fans at elevations from 5,000 to 6,500 feet. It is derived primarily from basalt and may contain a small amount of eolian material at the top of the unit. Surface runoff is medium, and erosion hazard is severe.	2
Kim loam (3-12% slopes)	Derived from sandstone and shale on alluvial fans, benches. Permeability is moderately, and surface runoff is slow. Erosion hazard is moderate.	1
Morval loam (3-12% slopes)	Formed in reworked alluvium on mesas and sides of valleys from 6,500 to 8,000 feet. Surface layer is loam about 5 inches thick; upper subsoil is clay loam about 12 inches thick. Surface runoff is slow. Erosion hazard is slight.	1

Environmental Consequences

Proposed Action

Potential impacts to soils in the project area include removal of vegetation, increased susceptibility of the soils to water erosion, and contamination of soils with petroleum products. No soils that are subject to flooding or high water tables (e.g., Torrifluvents) would be affected by the proposed project, except for the floor of Helmer Gulch and some smaller drainages to be crossed using an open trench (see section on Riparian and Wetland Areas).

Implementation of the Proposed Action would initially disturb up to 96.5 acres of surface soils. Of this initial disturbance, 35.5 acres of temporary work space would be reclaimed and revegetated to mimic existing conditions, and 62.2 acres would remain permanent ROW, which would be reclaimed and revegetated to a grass-dominant community for operations and maintenance.

The current CRVFO land use plan (BLM 1999b) includes a requirement that surface-disturbing activities include special design or mitigation measures to minimize adverse impacts associated with construction on highly erodible soils on slopes steeper than 30%. Erosion and soil transport in all areas would be protected by proper BMPs incorporated as protective stipulations (see Appendix A).

Construction activities would cause mixing of soil horizons, slight to moderate increases in local soil loss, loss of soil productivity, and increased sediment available for transport to surface waters. Infestations of noxious weeds resulting from soil disturbance would also affect soil productivity. The potential for soil transport to surface waters would increase as a function of slope, proximity to streams, and type of disturbance.

Throughout the affected area, the potential would exist for accidental spills or leaks of petroleum products and hazardous materials during construction. These events would cause soil contamination. Long-term soil productivity could be achieved by continued maintenance to reduce erosion, remediation of soil contamination, and reduction in the pad footprint through interim reclamation. Such impacts could be adequately mitigated by the standard and site-specific COAs listed in Appendix A. Following interim and final reclamation, it would be the responsibility of the operator to continue revegetation efforts until self-sustaining communities of desirable vegetation has been established. Appropriate revegetation is important to mitigate soil erosion and weed infestations.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting soil resources are anticipated.

Analysis on Public Land Health Standard 1 for Upland Soils

Standard 1 for upland soils was being met at all 58 upland sites assessed during the Divide Creek LHA (BLM 2009), although some minor problems were observed, including evidence of pedestalling, gullying, less litter than expected, and the presence of a compaction layer. The Rifle-West watershed is meeting Standard 1 for healthy soils on a site-by-site basis (BLM 2005). Across the watershed were areas where accelerated soil erosion was identified; however, these areas (Riley Gulch and Cottonwood Gulch) are outside the Pumba Pipeline project area.

The Proposed Action would result in disturbance of native soils; however, appropriate project design and measures attached as COAs (Appendix A) for controlling erosion and revegetating disturbances would minimize long-term impacts to soil volume and productivity. Therefore, the Proposed Action is not expected to contribute to a failure of the area to meet the soil standard.

3.16 Special Status Species

Federally Listed, Proposed, or Candidate Threatened or Endangered Species

Affected Environment

Table 10 presents information on Federally listed, proposed, or candidate plant and animal species known to occur in portions of CRVFO and vicinity with potentially suitable habitats. Project-specific surveys to identify presence/absence of plants and presence of suitable habitat for wildlife were conducted in 2011.

Table 10. Potential for Occurrence of Threatened or Endangered Species				
<i>Species and Status</i>	<i>Occurrence</i>	<i>Habitat Association</i>	<i>Range or Habitat in Vicinity?</i>	<i>Potentially Affected?</i>
Vascular Plants				
Parachute penstemon (<i>Penstemon debilis</i>) -- Threatened	Sparsely vegetated, south-facing, steep, white shale talus of the Parachute Creek Member of the Green River Formation; 8,000 to 9,000 feet	Other oil shale endemic species, such as Roan Cliffs blazing-star, Cathedral Bluffs meadow-rue, dragon milkvetch, Piceance bladderpod, and oil shale fescue	No	No
DeBeque phacelia (<i>Phacelia submutica</i>) – Threatened	Sparsely vegetated, steep slopes in chocolate-brown, gray, or red clay on Atwell Gulch and Shire Members, Wasatch Formation; 4,700 to 6,200 feet	Desert shrubland with four wing saltbush, shadscale, greasewood, broom snakeweed, bottlebrush squirreltail and Indian ricegrass, grading upward into scattered junipers	No	No
Colorado hookless cactus (<i>Sclerocactus glaucus</i>) – Threatened	Rocky hills, mesa slopes, and alluvial benches in salt desert shrub communities; often with well-formed microbiotic crusts; can occur in dense cheatgrass 4,500 to 6000 feet	Desert shrubland with shadscale, galleta grass, black sagebrush, Indian ricegrass grading upward into big sagebrush and sagebrush/pinyon-juniper	No	No
Ute ladies'-tresses orchid (<i>Spiranthes diluvialis</i>) – Threatened	Subirrigated alluvial soils along streams and in open meadows in floodplains; 4,500 to 6,800 feet	Box elders, cottonwoods, willows, scouring rushes, and riparian grasses, sedges, and forbs	No	No
Vertebrate Wildlife				
Canada lynx (<i>Lynx canadensis</i>) – Threatened	Expanses of subalpine and upper montane coniferous forests	Spruce-fir forests; also lodgepole pine and aspen	No	No

Table 10. Potential for Occurrence of Threatened or Endangered Species

<i>Species and Status</i>	<i>Occurrence</i>	<i>Habitat Association</i>	<i>Range or Habitat in Vicinity?</i>	<i>Potentially Affected?</i>
Yellow-billed cuckoo (<i>Coccyzus americanus</i>) – Candidate	North Fork of Gunnison, Colorado, Dolores, Yampa, and Rio Grande rivers	Large cottonwood stands along rivers	No	No
Mexican spotted owl (<i>Strix occidentalis lucida</i>) – Threatened	No historic occurrence in area; present in southwestern Colorado and southern Front Range	Rocky cliffs within closed-canopy coniferous forests	No	No
Colorado pikeminnow (<i>Ptychocheilus lucius</i>) – Endangered	Occur in the mainstem of the Colorado and Yampa Rivers in Colorado, downstream through Utah	Colorado, Green River, and Lower Yampa and White Rivers	Yes	No
Bonytail chub (<i>Gila elegans</i>) – Endangered			No	No
Humpback chub (<i>Gila cypha</i>) -- Endangered			No	No
Razorback sucker (<i>Xyrauchen texanus</i>) – Endangered			Yes	No
Greenback cutthroat trout (<i>Oncorhynchus clarki stomias</i>) – Endangered	Native in South Platte drainage, recently documented in the CRVFO	Clear, cold mountain streams	No	No

Environmental Consequences

Proposed Action

Results of a plant surveys conducted in 2011 indicate no suitable habitat for Federally listed, proposed, or candidate plants in the project area. Therefore, the project would have “**No Effect**” on these species.

Results of habitat surveys for listed, proposed, or candidate wildlife species in fall 2011 indicated that none of the terrestrial wildlife species known to occur in the CRVFO is likely to occur in the project vicinity or to be potentially affected by project activities. Therefore, the project would have “**No Effect**” on these species.

Note that two species of endangered big-river fishes—the Colorado pikeminnow and razorback sucker—are described in Table 10 as having suitable habitat in the project vicinity but not being potentially affected by the project. These species occur as far upstream in the mainstem of the Colorado as Rifle, including the segment to be crossed by the proposed pipeline. However, the pipeline would be installed by boring beneath the river, and both terminus locations would be outside the floodplain and associated riparian/wetland habitats. In addition, although some surface disturbance would occur along the remainder of the pipeline corridor, including an open-trench crossing of Helmer Gulch and several minor, unnamed ephemeral drainages, these crossings are not anticipated to result in transport of sediments or chemical pollutants to the Colorado River. Furthermore, water used for pressure-testing of the pipeline would not be taken from the Colorado River and therefore would not represent

significant depletions in flows. Based on these considerations, the Proposed Action would also have “**No Effect**” on the endangered big-river fishes.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting Federally listed, proposed, or candidate threatened or endangered species are anticipated, resulting in a determination of “**No Effect.**”

BLM Sensitive Species

PLANTS

Affected Environment

BLM sensitive plant species with habitat and/or occurrence records in Garfield County are listed in Table 11. Project-specific surveys to identify suitable habitat and presence/absence of sensitive plants were conducted in 2011.

Table 11. Potential for Occurrence of BLM Sensitive Plant Species				
<i>Species and Status</i>	<i>Occurrence</i>	<i>Habitat Association</i>	<i>Range or Habitat in Vicinity?</i>	<i>Potentially Affected?</i>
Vascular Plants				
Debeque milkvetch <i>(Astragalus debequaeus)</i>	Varicolored, fine-textured, seleniferous or saline soils of Wasatch Formation-Atwell Gulch Member; 5,100 to 6,400 feet	Pinyon-juniper woodlands and desert shrub.	No	No
Naturita milkvetch <i>(Astragalus naturitensis)</i>	Sandstone mesas, ledges, crevices and slopes in pinyon/juniper woodlands; 5,000 to 7,000 feet	Pinyon-juniper woodlands	No	No
Piceance bladderpod <i>(Lesquerella parviflora)</i>	Shale outcrops of the Green River Formation, on ledges and slopes of canyons in open areas; 6,200 to 8,600 feet	Pinyon-juniper woodlands, shrublands; often with other oil shale endemic species	No	No
Roan cliffs blazing-star <i>(Mentzelia rhizomata)</i>	Steep, eroding talus slopes of shale, Green River Formation; 5,800-9,000 feet	Pinyon-juniper woodlands, shrublands; often with other oil shale endemic species	No	No
Harrington's beardtongue (<i>Penstemon harringtonii</i>)	Sagebrush shrublands, including invaded by pinyon/juniper, rocky loams and rocky clay loams derived from coarse calcareous parent materials (basalt); 6,200-9,200 feet	Sagebrush, with some scattered pinyon-juniper	Yes	Yes

Table 11. Potential for Occurrence of BLM Sensitive Plant Species				
<i>Species and Status</i>	<i>Occurrence</i>	<i>Habitat Association</i>	<i>Range or Habitat in Vicinity?</i>	<i>Potentially Affected?</i>
Cathedral Bluffs meadow-rue (<i>Thalictrum heliophilum</i>)	Endemic on sparsely vegetated, steep shale talus slopes of the Green River Formation; 6,300-8,800 feet	Pinyon-juniper woodlands, shrublands; often with other oil shale endemic species; sometimes with rabbitbrush, snowberry	No	No

Note that only one species, Harrington’s penstemon (*Penstemon harringtonii*), was considered potentially present based on location, habitat, and environmental conditions. Initial surveys in 2011 revealed the presence of penstemon plants that, due to the timing of the survey outside the flowering season, could not be definitely identified as Harrington’s versus the more common Osterhout’s penstemon (*Penstemon osterhoutii*)(RMES 2011). Follow-up surveys in May 2012 showed that the large majority of the plants were Harrington’s. These plants were documented between MPs 4 and 5.5 (Figure 3).

Environmental Consequences

Proposed Action

Surveys conducted for this project estimated that approximately 5,020 penstemon plants, most or all of which have been confirmed as Harrington’s penstemon, would be affected by implementation of the Proposed Action (RMES 2011). Since the species was confirmed as Harrington’s penstemon, areas with a high density (6 or more plants per 100 square feet) would be avoided by shifting the pipeline alignment or narrowing the construction corridor by “stovepiping” or “end-hauling” (i.e., hauling and placing excavated material beyond one or both ends of the affected section instead of sidecasting the material).

Implementation of these measures and the site-specific COAs included in Appendix A for the protection of Harrington’s penstemon are expected to reduce the number of affected individuals significantly. Although the exact reduction in numbers of plants lost cannot be quantified owing to annual differences in densities and populations of Harrington’s penstemon in occupied sites, it is expected that less than 20% of the local population would be affected. This impact would be mitigated by collecting seed during the 2012 growing season and, if sufficient seed quantities are available and the pipeline is not yet constructed, also during the 2013 flowering season from some or all of the plants to be lost.

Collected seed would be taken to the USDA Plant Materials Center in Meeker, Colorado, to use in growing and producing more seeds. A portion of the produced seeds would be inter-seeded into the reclamation on portions of the pipeline from which seeds were collected. The standard reclamation seed mix would also be modified in these areas to promote plant species with which Harrington’s penstemon is commonly associated.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting BLM sensitive plants are anticipated.

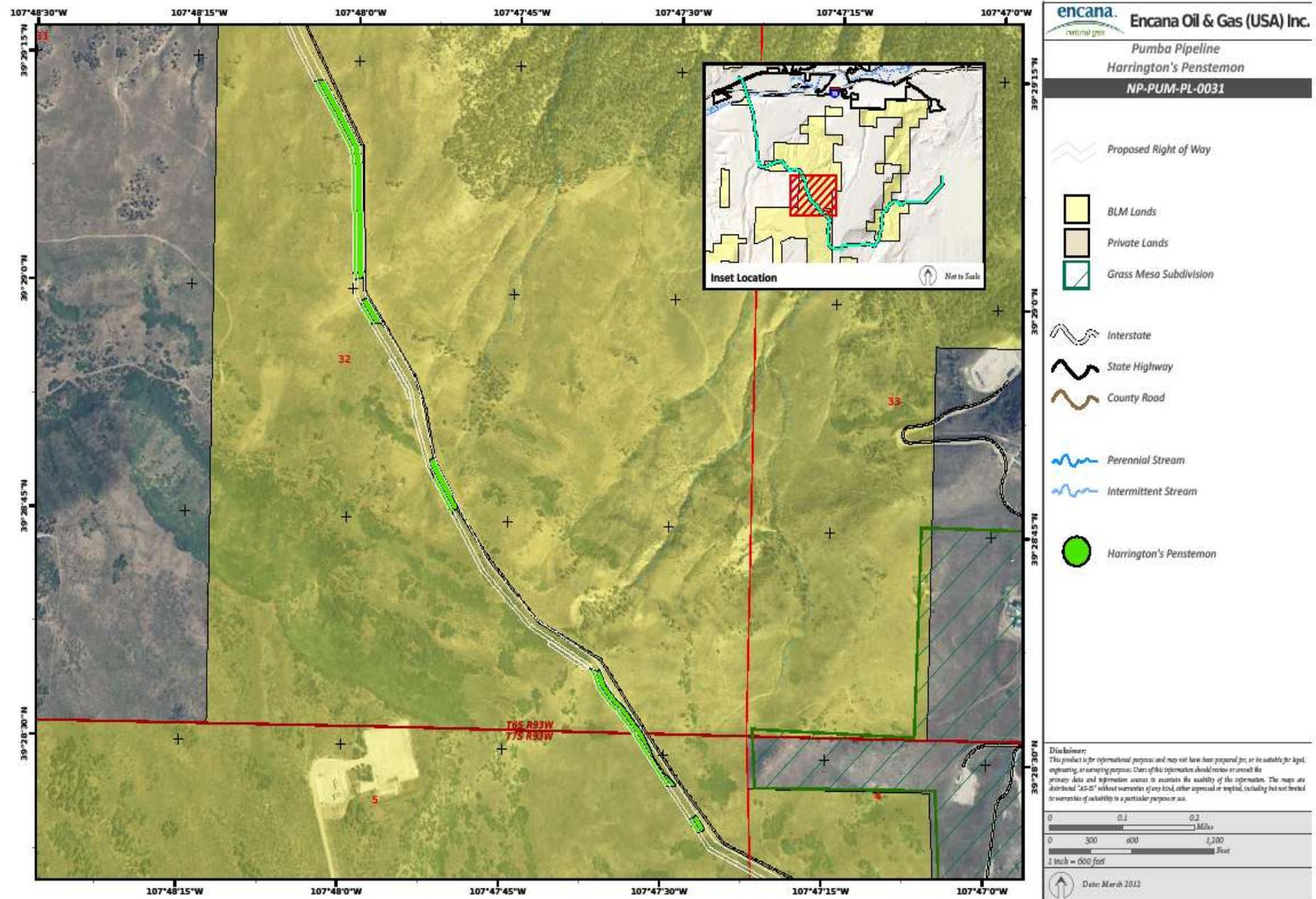


Figure 3. Areas of Pumba Pipeline Corridor with Populations of Harrington's Penstemon

BLM Sensitive Animal Species

Affected Environment

BLM sensitive animal species with habitat and/or occurrence records in the portion of the CRVFO that includes the project area and vicinity are listed in Table 12.

Table 12. Potential for Occurrence of BLM Sensitive Animal Species				
<i>Species and Status</i>	<i>Occurrence</i>	<i>Habitat Association</i>	<i>Range or Habitat in Vicinity?</i>	<i>Potentially Adversely Affected?</i>
Fringed myotis	<i>Myotis thysanodes</i>	Roosts in caves or mines near pine forests, oak brush, greasewood or saltbush shrublands at elevations up to 7,500 feet.	Yes	No
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Roosts in caves or rock crevices near semi-desert shrublands and pinyon-juniper woodlands.	Yes	No
White-tailed prairie dog	<i>Cynomys leucurus</i>	Breeds colonially in areas with short grasses and low shrubs, western end of CRVFO	No	No
Northern goshawk	<i>Accipiter gentilis</i>	Nests and hunts in montane and subalpine coniferous and aspen forest; winter vagrant in pinyon-juniper at lower elevations	Yes	No
Ferruginous hawk	<i>Buteo regalis</i>	Inhabits open, semi-desert shrublands; nests in cliffs or trees; western part of CRVFO	No	No
Bald eagle	<i>Haliaeetus leucocephalus</i>	Nests and roosts in Colorado River riparian corridor; hunts for fish and waterfowl along the river and major tributaries.	Yes	No
Peregrine falcon	<i>Falco peregrinus</i>	Nests on high cliffs, especially near major rivers and lakes; hunts primarily for waterfowl, upland fowl, and other birds	Yes	No
Greater sage-grouse	<i>Centrocercus urophasianus</i>	Limited to diverse age-class stands of sagebrush and shrub-steppe habitats; eastern part of CRVFO	No	No
Brewer's sparrow	<i>Spizella breweri</i>	Nests in expansive sagebrush stands, especially Wyoming big sagebrush at low to middle elevations and on gentle to rolling terrain	Yes	Yes
Midget faded rattlesnake	<i>Crotalus viridis ssp. concolor</i>	Habitat varies from riparian to semi-desert shrublands and foothills; western part of CRVFO	No	No
Great Basin spadefoot	<i>Spea intermontana</i>	Rocky canyons, shrublands, semi-desert shrublands, or pinyon-juniper woodlands with available water sources for reproduction	No	No

Table 12. Potential for Occurrence of BLM Sensitive Animal Species				
<i>Species and Status</i>	<i>Occurrence</i>	<i>Habitat Association</i>	<i>Range or Habitat in Vicinity?</i>	<i>Potentially Adversely Affected?</i>
Northern leopard frog	<i>Lithobates pipiens</i>	Wet meadows and the banks and perennial ponds, marshes, lakes, and slow-flowing streams	Yes	No
Roundtail chub	<i>Gila robusta</i>	Small to mid-size tributaries in the upper Colorado River basin	Yes	No
Bluehead Sucker	<i>Catostomus discobolus</i>			
Flannelmouth sucker	<i>Catostomus latipinnis</i>			
Mountain sucker	<i>Catostomus platyrhynchus</i>	Rivers and streams with gravel, sand, and mud substrates; higher up in the Colorado River basin	No	No
Colorado River cutthroat trout	<i>Oncorhynchus clarki pleuriticus</i>	Cold to cool water perennial streams, including small streams	No	No

Environmental Consequences

Proposed Action

Of the species indicated in Table 13 as potentially present, shown by bold type, specifics of the pipeline alignment and/or construction season, habitat requirements and uses of the indicated species, and mitigation measures to be applied as COAs (Appendix A), none is expected to be significantly affected by the Proposed Action. The bases for this determination are summarized below.

Fringed Myotis and Townsend’s Big-eared Bat – No caves or other suitable roosting sites occur in the project area. Loss of large trees, potentially also used for roosting, would be negligible. No new loss of habitat above which the bats could search for aerial prey would occur, and the area they might avoid during nighttime drilling and completion activities would represent a small portion of their total feeding range, if present.

Northern Goshawk – Although this species nests at elevations higher than the project area, goshawks may move to lower elevation pinyon-juniper habitats in search of prey during winter. However, because these vagrant hawks are not tied to specific territories, the hunt across broad areas, and short-duration disturbance along the pipeline corridor would not be expected to affect hunting success. In addition, the pipeline would be conducted outside the winter season, when northern goshawks would not normally be present.

Bald Eagle – Formerly listed as endangered, downlisted to threatened, and then removed from the endangered species list, the bald eagle remains protected by the Bald and Golden Eagle Protection Act (BGEPA). The Colorado River in the vicinity of Rifle and Parachute supports both resident breeding bald eagles and seasonal wintering eagles. Within 0.5 mile of the proposed pipeline alignment, CPW has nocturnal winter roosting habitat, and nest site has been documented approximately 0.9 mile upstream from the proposed pipeline bore beneath the Colorado River. Although bald eagles use the river to hunt for fish and waterfowl—their preferred prey—installation of the pipeline would be bored beneath the river, with the two ends of the bore located off the floodplain and well outside the riparian habitat.

Peregrine Falcon – Also formerly listed as endangered, downlisted to threatened, and then removed from the endangered species list, the peregrine falcon typically nests near the top of prominent cliffs overlooking a lake, river, or expanse of open terrain dominated by low-growing vegetation. From nesting and roosting sites on cliffs, peregrines may travel considerable distance in search of their preferred prey, including waterfowl, upland fowl, and other birds. No suitable nesting habitat is available in the project vicinity, although the Roan Cliffs north of the Colorado provide nest sites, and the river provides suitable prey. Use by peregrines of portions of the pipeline alignment involving open-trench construction and intensive human activity is not expected.

Brewer's Sparrow – This migratory songbird is a near-obligate on sagebrush shrublands and is most common in extensive stands of Wyoming or mountain big sagebrush on gentle or rolling terrain at lower and middle elevations. The project area includes potentially suitable sagebrush stands, and pipeline construction during the nesting season could result in direct loss of nests, eggs, or young as well as displacement of nesting adults due to the operation of heavy equipment and other construction-related activities. However a standard COA (Appendix A) would prohibit vegetation removal and other surface-disturbing activities during the period May 1 to June 30 unless a survey during the nesting season demonstrates that no Brewer's sparrows are nesting within the affected area (also see the section on Migratory Birds).

Northern Leopard Frog – The northern leopard frog is limited to perennial waters, including ponds and slow-flowing perennial streams or persistent portions of intermittent streams. This species requires aquatic habitats providing good water quality and abundant aquatic or shoreline vegetation. The proposed pipeline route does not cross good-quality leopard frog habitat, including the reach of Helmer Gulch to be crossed by the pipeline. Although leopard frogs may occur in overbank waters along the Colorado River floodplain, these areas would not be directly affected because the pipeline would be installed beneath the river in a bore, with its two terminus locations would be outside any potential habitat.

Roundtail Chub, Bluehead Sucker, and Flannelmouth Sucker – Because the proposed pipeline would not cross any perennial streams or persistent reaches of intermittent streams, none of the BLM sensitive nongame fishes potentially present within the general portion of the CRVFO. Although these species may occur in suitable reaches and aquatic habitats of the Colorado River mainstem, the crossing of the river by the proposed pipeline would be accomplished by boring beneath the channel, avoiding any impacts to the river or adjacent riverine habitats.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting BLM sensitive animal species are anticipated.

Analysis on Public Land Health Standard 4 for Special Status Species

According to the Divide Creek LHA (BLM 2009), qualitative information suggests all sites with potential special status species habitat were in good condition, providing healthy and productive habitat. Based on the overall condition of upland and riparian habitats located on public lands, suitable habitat is available for BLM sensitive plant and terrestrial wildlife species within the Divide Creek LHA. Thus, Standard 4 for BLM sensitive terrestrial wildlife species is being met within the Divide Creek watershed.

The Rifle-West LHA (BLM 2009) states that Standard 4 is presently being met for Harrington's penstemon, but the populations are at risk due to increasing natural gas development within its habitat. It goes on to say that Standard 4 is currently being met for each Special Status species across

the landscape and on an allotment-specific basis. However, the habitat alteration associated with the Proposed Action would likely contribute to a declining trend and help to reduce the potential for meeting or maintaining Standard 4 for special status species over the long term. With implementation of the mitigation measures identified in this section and elsewhere in the EA, Standard 4 for special status species and their habitats would be achieved in conjunction with the proposed project.

3.17 Vegetation

Affected Environment

The primary vegetation types along the proposed pipeline route include dryland and irrigated agricultural fields (dominated by agricultural grasses), pinyon-juniper (*Pinus edulis*-*Juniperus osteosperma*) woodland, big sagebrush (*Artemisia tridentata*) shrubland, and Gambel's oak (*Quercus gambelii*)-mixed montane shrublands. A small component of the route on Flatiron Mesa was historically pinyon-juniper and Gambel's oak woodland but burned approximately 30 years ago and is now dominated by younger oaks and other montane shrub. Pinyon-juniper trees are infrequent within the actual corridor and would be avoided where practicable.

At the northern end of the bore, irrigation return flows and irrigation water ponding up against the railroad grade appear to be supporting wetlands. Other areas of wetlands include the proposed open-trench crossing of Helmer Gulch and areas adjacent to the Colorado River, which would not be affected because of boring beneath the river for the pipeline. See the section on Riparian and Wetland areas for a description of these areas.

While the proposed route bisects many of the above-mentioned habitat types, much of the area has already been impacted by past and recurring pipeline construction and maintenance activities. Along the existing ROWs, reclamation of the area has changed the vegetation communities to more grass-dominated habitats. Non-native pasture grasses such as smooth brome (*Bromus inermis*), orchardgrass (*Dactylis glomerata*), intermediate wheatgrass (*Thinopyrum intermedium*), and crested wheatgrass (*Agropyron cristatum*) dominate these areas, with some stands containing significant amounts of native western wheatgrass (*Pascopyrum smithii*).

Environmental Consequences

Proposed Action

Construction of the proposed pipeline would result in both direct and indirect effects on vegetation. Direct effects would include short-term and long-term loss of vegetation and long-term modification of community structure and composition. Indirect effects could include increased potential for noxious weed invasion, increased soil erosion and sedimentation, reduced wildlife habitat quantity or quality, and changes in fire regime.

The Proposed Action would result in the loss of 96.5 acres of vegetation, 49.9 acres of which is on BLM land. With implementation of standard COAs (Appendix A), desirable forbs and grasses in portions of the pipeline corridor cleared for construction could be established within 2 to 5 years. Reestablishment of mixed mountain shrubs and pinyon-juniper would require decades or longer. Areas temporarily affected but without stripping of topsoils would be encouraged to return to native conditions through weed control and reseeding if necessary. The success or failure of revegetation—related to climatic conditions, intensity of grazing by livestock and wildlife, and the effectiveness of seedings and weed control—would affect the recovery rate for other resources such as soils, water quality, wildlife, and visual resources.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting BLM sensitive animal species are anticipated.

Analysis on Public Land Health Standard 3 for Plant and Animal Communities

According to both the Divide Creek and Rifle-West LHAs (BLM 2009), the project area was meeting the standard at that time, although problems were noted. These included invasive weeds, inadequate litter cover, and the decline in diversity and abundance of functional groups such as cool season perennial grasses and perennial forbs. Noxious weeds and undesirable species varied in distribution and cover throughout the landscapes. Due to the intensity of uses and activities occurring in the landscape, including natural gas development, noxious weeds were common on a number of sites, particularly at the lower elevations. Other undesirable non-natives such as Kentucky bluegrass (*Poa pratensis*) and common dandelion (*Taraxacum officinale*) were fairly common in the mixed mountain shrub communities at middle elevations.

Surface disturbance associated with the Proposed Action has the potential to encourage expansion and dominance of the site by invasive, non-native species. Appendix A includes COAs to be applied to facilitate revegetation of surface disturbances with native species and to control noxious weeds. If successfully revegetated, the Proposed Action would not contribute to the failure of the area to meet Standard 3.

3.18 Visual Resources

Affected Environment

The proposed pipeline would be located on a combination of BLM and private lands. The lands administered by the BLM are classified as Visual Resource Management (VRM) Classes II, III, and IV, as identified by the 1984 Glenwood Springs Resource Management Plan (RMP) (BLM 1984) (Figure 4). The objectives for VRM Class II, III, and IV are defined in the BLM's Manual H-8410-1 Visual Resource Inventory (BLM 1986), as follows.

- VRM Class II – The objective is to retain the existing character of the landscape. The level of change to the characteristic landscape 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.
- VRM Class III – The objective is 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.
- VRM Class IV – The objective of is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of the viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

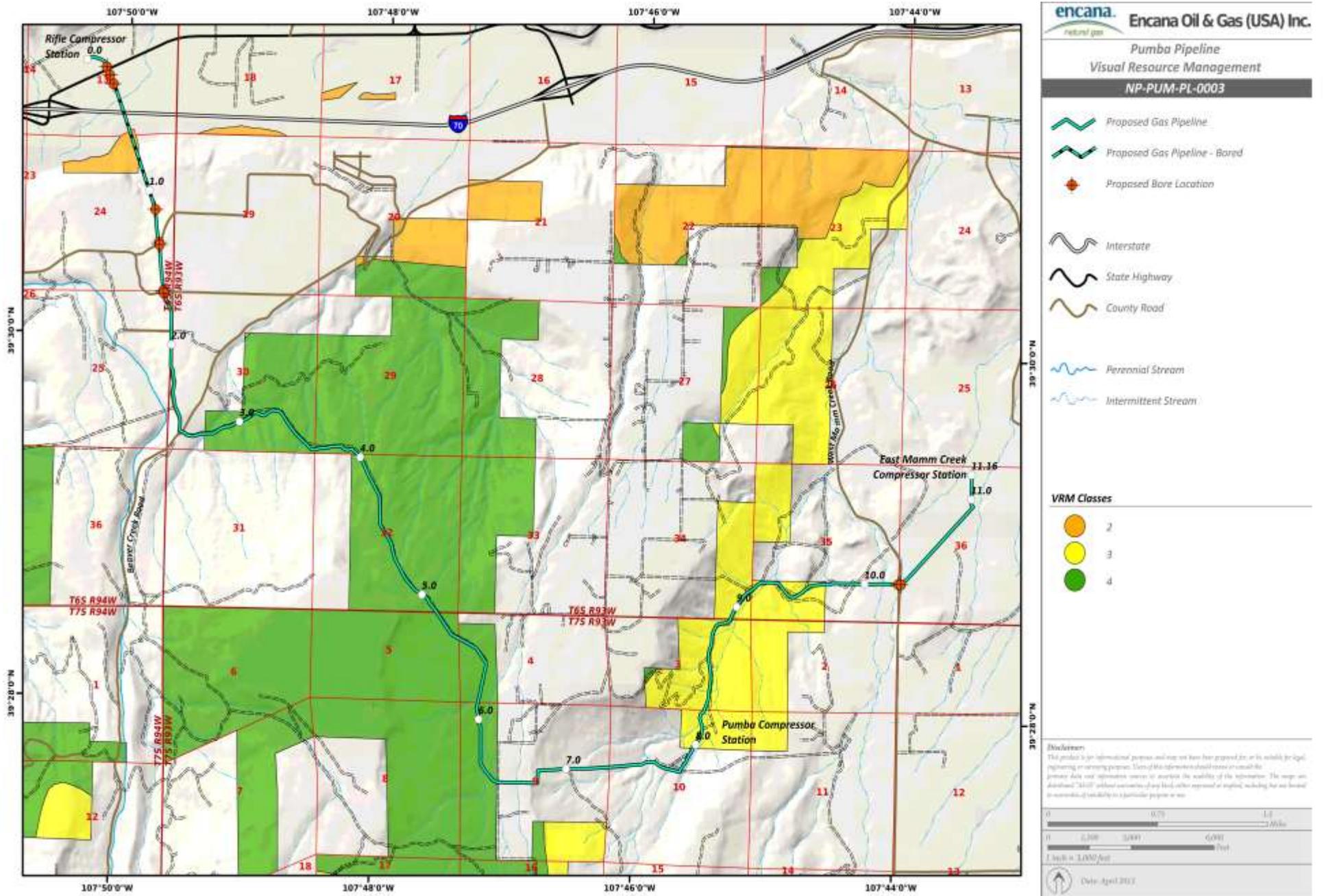


Figure 4. VRM Classes in the Project Area

VRM objectives do not apply to private lands, although visual values are protected by landowner discretion and BLM’s regulatory authority. The northwestern end of the proposed pipeline at the Rifle compressor station is on private lands. From this point MP 1, the alignment traverses an area of BLM land designated VRM Class II, but the pipe would be entirely underground for all but the first 0.25 mile of this section. From MP 1 to almost MP 7, the pipeline ROW traverses areas of BLM lands designated as VRM Class IV. From MP 7 to the termination point at the East Mamm compressor station, the pipeline ROW traverses an area of BLM land designated VRM Class III.

The Pumba Pipeline alignment generally occurs on flat mesa tops, from Taughenbaugh Mesa near the northwestern end, across the flanks of Grass Mesa, continuing on the moderate slopes and northern shoulder of Flatiron Mesa, and ending on Hunter Mesa. To the west of the project area is Beaver Creek; to the east is Mamm Creek. Primary vegetation types along the route include dryland and irrigated agricultural fields (dominated by agricultural grasses and alfalfa), pinyon-juniper woodland, big sagebrush shrubland, and Gambel’s oak shrublands. Pinyon-juniper trees are infrequent within the actual corridor.

Most of the proposed route follows an existing ROW that has been revegetated to a grass-dominated community. The project area contains evidence of oil and gas exploration and development. The area is also used as ranchland and for dispersed recreation, primarily hunting. Modification of the existing landscape is evident since the project area is within and adjacent to an existing pipeline ROW. Electrical transmission lines and dirt roads also cross the project area.

The visual resource analysis area includes CR319, CR321, CR328, I-70, US 6, the Rifle Bypass, and Grass Mesa Road. These areas encompass views by people who live, work, ranch, and recreate in the area. BLM guidance states that lands with high visual sensitivity are those within 5 miles of a primary travel corridor and of moderate to very high visual exposure, where details of vegetation and landform are readily discernible and changes in visual contrast easily noticed by the casual observer. The visual impact analysis for this project is based on views from eight key observation points (KOPs)(Photos 1 – 10) representing locations with the greatest number of viewers by being along well-travelled roads. People who ranch and recreate in the area and those who drive through the area can see portions of the project from these KOPs.

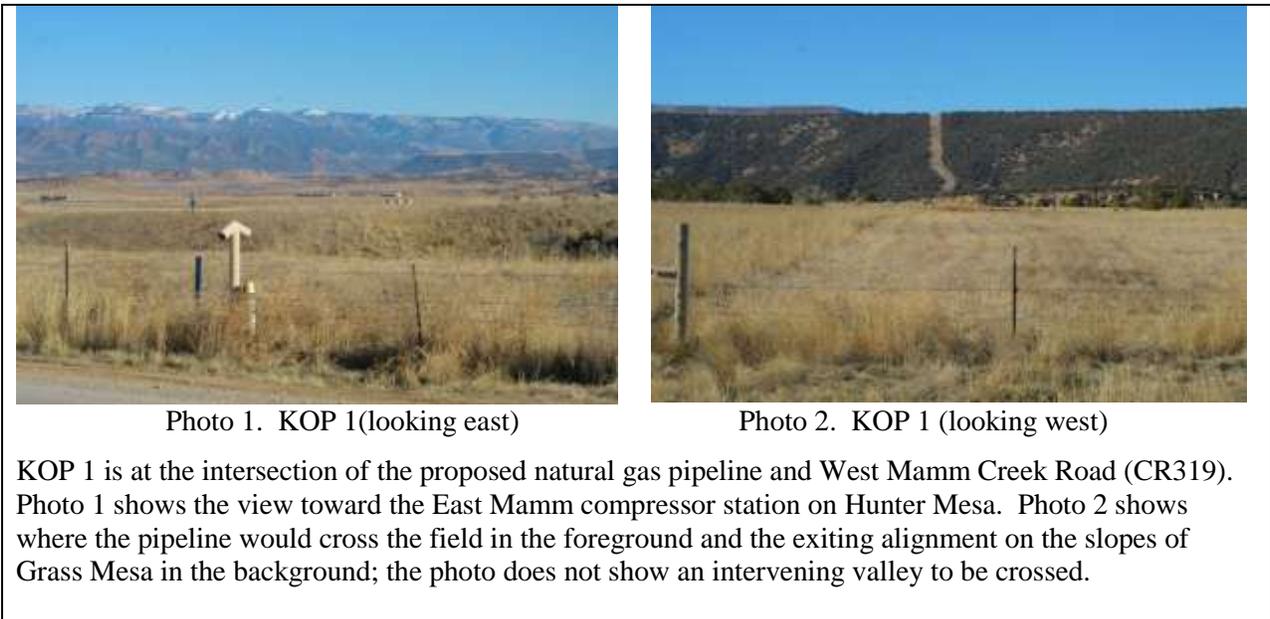


Photo 1. KOP 1(looking east)

Photo 2. KOP 1 (looking west)

KOP 1 is at the intersection of the proposed natural gas pipeline and West Mamm Creek Road (CR319). Photo 1 shows the view toward the East Mamm compressor station on Hunter Mesa. Photo 2 shows where the pipeline would cross the field in the foreground and the exiting alignment on the slopes of Grass Mesa in the background; the photo does not show an intervening valley to be crossed.



Photo 3. KOP 2 (looking southwest)

KOP 2, farther south on Mamm Creek Road, shows the view to the southwest across private land. The segment that crosses BLM lands (VRM Class III) is not visible from this road.



Photo 4. KOP 3 (looking west)

KOP 3 is within the Grass Mesa Subdivision showing the existing ROW. This KOP represents a typical view of the project as it would be seen by residents and demonstrates that the pipeline would disappear from view as it wraps around the north slope of Flatiron Mesa.



Photo 5. KOP 4 (looking south)



Photo 6. KOP 4 (looking north)

KOP 4 is at the intersection of the proposed pipeline and the heavily traveled Taughenbaugh Mesa Road (CR321). Photo 5 shows an above-ground appurtenance related to oil and gas development in the foreground. Photo 6 shows typical agricultural lands within the project area. Proposed segments on BLM lands are not visible at this KOP.



Photo 7. KOP 5 (looking south)

KOP 5 is at the intersection of the proposed pipeline and the Rifle-Rulison Road (CR320), another heavily travelled road. The view is south, across private land toward a residence; an existing ROW traverses the area shown.



Photo 8. KOP 6 (looking south)

KOP 6 is along US 6 near the northern bore terminus, looking across disturbed grassland, the railroad, and I-70 to Taughenbaugh Mesa and beyond. This view is seen by both eastbound and westbound travelers on US 6. The pipeline would be bored instead of trenched where it crosses the mesa slopes.



Photo 9. KOP 7 (looking south)

KOP 7 is typical of the view a casual observer would have from US 6 at West Rifle exit. Snow-clad Flatiron Mesa is in left-center background. Slopes of Taughenbaugh Mesa are past trees in lower right.



Photo 10. KOP 8 (looking south)

KOP 8, taken from the Rifle Bypass roadway, represents the context of the Proposed Action. The pipeline would cross the north face of Flatiron Mesa (forested slopes in left-center background) and drop across the Beaver Creek drainage to Taughenbaugh Mesa (grassy slopes in right-center middle ground).

When the pipeline corridor is pioneered, 96.5 acres of vegetation would be cleared. In areas along the corridor where pinyon or juniper trees would need to be removed, the vegetation along the edges of the corridor, the BLM may require that the edges be thinned and feathered to soften the straight-line affect created by the ROW clearing. This modification in clearing would also need to accommodate Harrington's penstemon, a BLM sensitive plant species present in portions of the proposed alignment.

Vegetation removal and earthwork would alter the form, line, color, and texture of the existing landscape. These impacts would be visible to motorists on county roads, dispersed recreationists, and residents within the area as well as briefly to those travelling on I-70 and exiting at West Rifle. Short-term visual impacts would also include dust and increased traffic from construction. Such impacts should be adequately mitigated by proper utilization of the standard and site specific COAs (Appendix A). BMPs related to reclamation and facility paint colors would mitigate the visual impacts created by the installation and are applied as site specific COAs in Appendix A. After installation of the natural gas pipeline, all disturbed construction areas would be returned to pre-construction grades and contours. Topsoil would then be re-placed onto the recontoured surface and seeded with one or more seed mixes approved by the BLM (Appendix B). Reclamation would stabilize the soil, ensure erosion control over the long term, and enhance visual resources along the ROW.

MP 0 to MP 1 – This is the location where the pipeline would go under US 6 via a conventional bore to minimize impacts to traffic along the road. The staging areas for the bore locations would be located on private lands. Surface disturbance would occur on private land and would be associated with the staging areas on the north and south sides of US 6 to accommodate the boring equipment (approximately 0.3 acre). This is also the location where the pipeline would go under the Colorado River via a horizontal directional drill (also known as a bore). The staging areas for the bore location would be located on private land; whereas the actual bore would go underneath both private and BLM VRM Class II land.

No visual impacts would be associated with the bore on VRM Class II land. The bore itself would go under the Colorado River and the parcel of BLM land. Surface disturbance would occur on private land and would be associated with the staging areas in the meadow on the south side of Hwy 6 to accommodate the drilling and support equipment (approximately 0.3 acre). The surface disturbance associated with the bores would be minimal and short-term. More surface disturbance would occur north and south of the bore entry and exit points where the pipeline trench would be located. The standard BMPs related to reclamation and facility paint colors would mitigate the visual impacts created by installation of the pipeline.

MP 1 to approximately MP 2.75 – The proposed pipeline and ROW would be entirely on private lands across this portion of the project area; it follows an existing ROW, which would become wider with implementation of the proposed project. The other bore termination point would be within this stretch of pipeline. The staging areas for this bore location would be located on private land; there would be no visual impacts on BLM lands associated with this bore location. Surface disturbance would occur on private land and would be associated with the staging area on top of Taughenbaugh Mesa to accommodate the drilling and support equipment (approximately 2 acres). Standard BMPs to be applied as COAs (Appendix A) in relation to reclamation and facility paint colors would mitigate visual impacts.

MP 2.75 to MP 6.5 – From approximately MP 2.75 to MP 6, the proposed pipeline and ROW traverse lands managed by the BLM and designated as VRM Class IV. Even though VRM Class IV allows for major modification, every attempt should be made to mitigate for visual impacts along this segment of the project on BLM lands because it would more visible to more viewers than other portions of the project. Due to limited access from MP 3 to 6, the ROW would serve as access in this area. Topography constraints require two EWSs along this portion of the route at about MPs 4.5 and 5 (i.e., the northeastern slope of Flatiron Mesa). This would require more surface disturbance than in other areas because of the steep terrain and the need for two working platforms (two-toned) to accommodate worker safety. These EWSs are identified on the Proposed Action map (Figure 2).

MP 6.5 to MP 8 – The proposed pipeline and ROW would be entirely on private lands across this portion of the project area; it follows an existing ROW, which would become wider with implementation of the proposed project. The standard BMPs related to reclamation and facility paint colors would mitigate the visual impacts created by the installation and are applied as Standard COAs in Appendix A.

MP 8 to MP 9.5 – MP 8 is adjacent to the Pumba compressor station, which is on BLM managed lands with a VRM designation of Class III. The proposed pipeline and ROW skirt the compressor station to the southwest and follow the existing road and ROW to MP 9.5.

MP 9.5 to MP 11.2 – The proposed pipeline and ROW would be entirely on private lands across this portion of the project area; it follows an existing ROW, which would become wider with implementation of the proposed project and would terminate at the East Mamm compressor station.

In summary, although the proposed Pumba Pipeline and associate ROW would be visible throughout the analysis area, it would be consistent with BLM management direction for visual resources across the project area. Best management practices including softening the line of vegetation removal and revegetation would minimize the impacts of this project.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related impacts significantly affecting scenic quality or visual resources are anticipated.

3.19 Wastes, Hazardous or Solid

Affected Environment

The affected environment for hazardous materials includes air, water, soil, and biological resources that may potentially be affected by an accidental release of hazardous materials during transportation to and from the project area, storage, and use in construction and operations. Sensitive areas for hazardous

materials releases include areas adjacent to water bodies, above aquifers, and areas where humans or wildlife would be directly impacted.

BLM Instruction Memoranda numbers WO-93-344 and CO-97-023 require that all NEPA documents list and describe any hazardous and/or extremely hazardous materials that would be produced, used, stored, transported, or disposed as a result of a proposed project. The most pertinent of the Federal laws dealing with hazardous materials contamination are as follows:

- The Oil Pollution Act (Public Law 101-380, August 18, 1990) prohibits discharge of pollutants into waters of the US, which by definition would include any tributary, including any dry wash that eventually connects with the Colorado River.
- The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (Public Law 96-510 of 1980) provides for liability, compensation, cleanup, and emergency response for hazardous substances released into the environment. It also provides national, regional, and local contingency plans. Applicable emergency operations plans in place include the National Contingency Plan (40 CFR 300, required by section 105 of CERCLA), the Region VIII Regional Contingency Plan, the Colorado River Sub-Area Contingency Plan, and the BLM Grand Junction Field Office Hazardous Materials Contingency Plan.
- The Resource Conservation and Recovery Act (RCRA) (Public Law 94-580, October 21, 1976) regulates the use of hazardous substances and disposal of hazardous wastes. Note: While oil and gas lessees are exempt from RCRA, right-of-way holders are not. RCRA strictly regulates the management and disposal of hazardous wastes.

Emergency response to hazardous materials or petroleum products on BLM lands are handled through the BLM Grand Junction Field Office contingency plan. BLM would have access to regional resources if justified by the nature of an incident.

Environmental Consequences

Proposed Action

Possible pollutants that could be released during the construction phase of this project would include diesel fuel, hydraulic fluid, and lubricants. These materials would be used during construction of the pipeline and for refueling and maintaining equipment and vehicles. Potentially harmful substances used in the construction and operation phases would be kept onsite in limited quantities and trucked to and from the site as required. No hazardous substance, as defined by 40 CFR 355 would be used, produced, stored, transported, or disposed of in amounts above threshold quantities. Waste generated by construction activities would not be exempt from hazardous waste regulations under the oil and gas exploration and production exemption of RCRA. Exempt wastes would include those associated with well production and transmission of natural gas through the gathering lines and the natural gas itself.

With the exception of produced hydrocarbons, ethylene glycol (antifreeze), lubricants, and amine compounds, chemicals subject to reporting under Title III of the Superfund Amendments and Reauthorization Act in quantities of 10,000 pounds or more would not be used, produced, stored, transported, or disposed of during construction or operation of the facilities. None of the chemicals that would be used in construction meet the criteria for an acutely hazardous material/substance, or meet the quantities criteria per BLM Instruction Memorandum No. 93-344. In addition, no extremely hazardous substance, as defined in 40 CFR 355, in amounts above threshold planning quantities would be produced, used, stored, transported, or disposed of during construction or operation of the facilities.

Solid waste (human waste, garbage, etc.) would be generated during construction activities and, to a limited extent, during project operations. These would be periodically removed to a landfill or water treatment facility.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related increases in potential impacts from hazardous or solid wastes would be expected.

3.19 Water Quality, Surface and Ground

Surface Water

Affected Environment

Construction of the proposed Pumba Pipeline would occur within the Colorado Headwaters-Plateau Creek watershed (HUC level 8). Sub-watersheds in the project area to be crossed by the proposed pipeline include Outlet Mamm Creek, Dry Creek-Colorado River, and Beaver Creek-Colorado River (HUC level 12). Creeks in the project area include Mamm Creek, Dry Creek, Ramsay Gulch, and Beaver Creek, all of which drain to the Colorado River. A number of dry washes and gulches also occur within the project area.

The pipeline would cross the Colorado River in a bore beneath the riverbed. No other perennial streams would be crossed by the pipeline, but a number of ephemeral drainages to be crossed are considered Waters of the U.S. as defined by the U.S. Army Corps of Engineers (USACE) at 33 CFR Part 328. These Waters of the U.S. and associated wetlands are described in the section on Riparian and Wetland Areas. Although the pipeline would not cross Beaver Creek, the eastern portion would be constructed within the portion of the Beaver Creek drainage that is within the Rifle Watershed protection zone and require a permit from the City of Rifle.

According to the *Stream Classifications and Water Quality Standards* (CDPHE, Water Quality Control Commission [WQCC] Regulation No. 37) (CDPHE 2007), the mainstem of Dry Creek, including all tributaries and wetlands from a point immediately above Last Chance Ditch to the confluence with the Colorado River, are within segment 4f. Dry Creek is crossed by the proposed Pumba natural gas pipeline along the eastern portion of the project area at approximately MP 10.1. Following is a brief description of segment 4f:

Segment 4f – This segment has been classified as aquatic life cold 1, recreation N and agriculture. Aquatic life cold 1 indicates that this water course is currently capable of sustaining a wide variety of cold water biota, including sensitive species, or could sustain such biota but for correctable water quality conditions. Recreation class N refers to waters not suitable or intended to become suitable for primary contact recreation uses. This segment is suitable or intended to become suitable for irrigation of crops not hazardous as drinking water for livestock.

Streams within segment 4f are not on the State of Colorado *303(d) List of Impaired Waters and Monitoring and Evaluation List* (CDPHE, WQCC Regulation No. 93) (CDPHE 2010).

West Mamm Creek and Beaver Creek are the only perennial tributaries in the project vicinity, although neither is crossed by the proposed pipeline. These creeks see significant dewatering from agricultural activities associated with irrigation of hayfields and some small orchards. These activities reduce

instream flow and availability of waters to support wetlands and associated habitats. In the northern part of the project area, irrigation return flows are generally warmer than the native waters and can also contain increased levels of fertilizers, pesticides and other agriculture-related chemical constituents. Most of the roads in the area are dirt with a gravel surface and aggregate road base to support traffic related to oil and gas activities. Runoff from roads in the project area often contains fine materials transported to nearby drainages. Runoff events are mostly associated with snowmelt and protracted or intense rainfall events. Because of transport of fine sediments in runoff from roadways as well as the naturally steep and often sparsely vegetated native terrain, area streams may be characterized as sediment-rich environments.

Environmental Consequences

Proposed Action

The Proposed Action would result in approximately 96.5 acres of surface disturbance, which would be reclaimed, which are proposed in three phases. Interim and final reclamation plans would be implemented and monitored following the proposed construction activities. Potential impacts to surface waters as a result of the Proposed Action could occur from surface-disturbing activities, traffic, and waste management. Surface-disturbing activities associated with the pipeline can cause loss of vegetation cover, increased soil compaction, temporarily increased availability of sediments for runoff events, increased volume and velocity of runoff, and increase sedimentation to surface waters.

The proposed pipeline route has the potential to impact ephemeral drainages that are tributary to perennial waters (West Mamm Creek and Beaver Creek). Other substances associated with construction-related activities, including petroleum-based hydrocarbons, could also be carried by runoff into surface waters. Initially, impacts would be minimized by proper stormwater management and timely installation of BMPs, including control of erosion, stockpiling of topsoils, and timely rehabilitation of disturbed surfaces. Inspection and monitoring of construction activities to identify possible spill events and ensure required clean-up would also reduce these potential impacts.

Pipelines associated with the transport of liquids would be pressure-tested to detect leakage prior to use. Implementation of the standard and site-specific COAs for mitigating impacts to surface waters (Appendix A) would minimize risks of adverse impacts associated with construction and ongoing production activities. In addition, Encana would be required to obtain a Watershed Permit from the City of Rifle, which would will include protections tied specifically to protection of the municipal water supply.

Installation of the pipeline beneath the Colorado River would entail boring a depths anticipated to be too deep to allow the drilling mud (used as a lubricant) from reaching surface waters. In the unlikely event of a breach in native soil integrity and resultant migration of drilling mud to surface waters, localized cloudiness of surface waters from inflow of bentonite, a naturally occurring, non-toxic clay. Because drilling fluid pressures are constantly monitored, and loss in lubricating mud pressures would quickly be detected, immediate halting of drilling operations would significantly reduce the risk of soil integrity loss.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related increases in potential impacts from hazardous or solid wastes would be expected.

Analysis of Public Land Health Standard 5 for Water Quality

The Divide Creek LHA conducted in 2009 determined that all 19 lotic (stream) areas assessed were meeting Standard 5 for Water Quality. The West-Rifle LHA (2005) determined that most of the 20 areas assessed were meeting Standard 5 for water quality, with the exception of the lower reaches of Cottonwood Gulch and Riley Gulch, both of which are outside of this project area. The Pumba Pipeline project would not directly affect any perennial streams but would cross 20 dry drainages classified as Waters of the U.S., with of approximately 2,074 linear feet of pipeline length. Surface water quality is expected to continue to meet the criteria set by the State, thus meeting the land health standard. With the protective measures listed in Appendix A, the Proposed Action would be unlikely to prevent Standard 5 from being achieved.

Groundwater

Affected Environment

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

The project area is within the lower Piceance Basin aquifer system. Unconsolidated alluvial aquifers are the most productive aquifers in the basin. Groundwater in the basin exists in shallow, unconsolidated alluvium associated with the Colorado River (BLM 2006) and includes unconsolidated boulders, cobbles, gravel, sand, silt, and clay. The thickness of the alluvium is variable, but it tends to be thinner at the basin margins due to increased slopes and higher flow velocities, and thicker in the lower reaches where alluvium can accumulate. Alluvial wells are typically less than 200 feet deep, with water levels ranging from 50 to 100 feet.

The chemical quality of groundwater is dependent on the mineral composition and hydrologic properties of the aquifer. Factors such as surface contact, porosity, and rate of water movement all influence water quality. The quality of alluvial groundwater in the Colorado River Basin can vary widely and is affected by return flow quality, mineral weathering and dissolution, cation-anion exchange with alluvial minerals, and organic compound loading from fertilizer and pesticide leaching.

The most important bedrock aquifers in the area are known as the upper and lower Piceance Basin aquifer systems. South of the Colorado River, these aquifers have largely been eroded off, exposing the Wasatch Formation. The Wasatch Formation consists primarily of shales with minor lenticular sandstones that are water bearing in localized areas. Bedrock aquifers are recharged from snowmelt at higher elevations. In the Piceance Basin, groundwater flows from recharge areas near the margins of the basin to discharge areas along the principal stream valleys. The groundwater moves laterally and/or upward, discharging directly into streams, springs, and seeps. Natural discharge areas generally are found along the Colorado River and its tributaries (USGS 2007b).

According to CDWR, 87 freshwater wells are located within 0.5 mile of the proposed pipeline ROW, with the majority north of the corridor. About two-thirds of the wells are within the Beaver Creek-Colorado River watershed (HUC 12), and the other one-third are within the Dry Creek-Colorado River watershed (HUC 12). Of these wells, 34 are designated for domestic use, 15 for commercial use, 6 for livestock watering, 5 for irrigation, 1 for geothermal, and 26 for “other” uses.

Environmental Consequences

Proposed Action

Installation of the shallow pipeline is not expected to have significant adverse impacts on groundwater.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, resulting in cancellation or redesign of the project by Encana. Therefore, no project-related increases in potential impacts from hazardous or solid wastes would be expected.

3.20 Wildlife, Aquatic and Terrestrial

Aquatic Wildlife

Affected Environment

The project does not cross any perennial water bodies. The only wetland crossed (in Helmer Gulch), is tributary to the Colorado River, but it is not fish bearing due to a lack of water, nor does it appear sufficient to support the aquatic larvae of amphibians. No water from this wetland reaches the Colorado River due to agricultural diversions in the area.

Environmental Consequences

Proposed Action

The pipeline would be installed beneath the Colorado River in a bore, with surface impacts to the river or adjacent overbank waters or riparian and wetland habitats. No new water depletions would occur as a result of hydrostatic testing of the pipeline. Therefore, this project would have no effect on aquatic biota.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, presumably resulting in cancellation or postponement of the project. Therefore, no project-related increases in potential impacts from hazardous or solid wastes would be expected.

Analysis on Public Land Health Standard 3 for Plant and Animal Communities

The Proposed Action would not affect any fish-bearing streams or other persistent surface waters. Therefore, its implementation would not contribute to a failure of the area to meet Standard 3.

Terrestrial Wildlife

Affected Environment

Mammals

The Pumba Pipeline alignment is within CPW Data Analysis Unit (DAU) E14 for elk. Rocky Mountain elk (*Cervus elaphus nelsoni*) use the project area for foraging from late September through early June, with some incidental summer use. Given the elevation and location of big-game winter range on BLM

lands in the vicinity, elk may move out of the area during winters with deep snow accumulations and concentrate at lower elevations where snow is less deep and not as persistent. Habitats along the proposed route are dominated by east- or north-facing pinyon-juniper woodlands, irrigated pasturelands, and mixed mountain shrublands. Lands crossed by the alignment include winter range, winter concentration areas, and severe winter range, as mapped by CPW.

Small carnivores potentially present in the area include the long-tailed weasel (*Mustela frenata*), western spotted skunk (*Spilogale gracilis*), and ringtail (*Bassariscus astutus*) in native habitats in the southern part of the project area and the nearly ubiquitous striped skunk (*Mephitis mephitis*) and raccoon (*Procyon lotor*) in lower elevations along the Colorado River. Large carnivores present in the vicinity include the mountain lion (*Puma concolor*) and black bear (*Ursus americanus*). CPW has mapped the project area black bear overall range. The presence of Gambel's oak stands and other tall shrubs provides higher quality habitat for bears than the pinyon-juniper and pastureland habitats.

Small mammals present within the planning area include rodents such as the mountain cottontail (*Sylvilagus nuttallii*), desert cottontail (*S. audubonii*), rock squirrel (*Spermophilus variegatus*), golden-mantled ground squirrel (*S. lateralis*), least chipmunk (*Neotamias minimus*), bushy-tailed woodrat (packrat) (*Neotoma cinerea*), deer mouse (*Peromyscus maniculatus*), and long-tailed vole (*Microtus longicaudus*).

Birds

The section on Migratory Birds describes raptors and migratory passerines present or expected to occur within the project vicinity. Additional avian species likely to occur include upland fowl, water birds, and resident passerines. The only upland gamebird expected is the wild (*Meleagris gallopavo*), which is common throughout the general area in mountain shrub habitats where acorns, berries, and invertebrate prey in the dense leaf litter provide abundant food. In addition to use of the Colorado River channel by ducks and geese, a large wading bird, the great blue heron (*Ardea herodias*) hunts for prey along the river's edge and overbank areas and may roost and nest in large riparian cottonwoods.

Resident passerines particularly common in the project area include three corvids—the common raven (*Corvus corax*), American crow (*C. brachyrhynchos*), and black-billed magpie (*Pica hudsonia*)—in addition to the native house finch (*Carpodacus mexicanus*) and non-native Eurasian starling (*Sturnus vulgaris*) in addition to the non-native rock pigeon (*Columba livia*). Migratory blackbird species common around agricultural and rural residential areas include Brewer's blackbird (*Euphagus cyanocephalus*), common grackle (*Quiscalus quiscula*), and brown-headed cowbird (*Molothrus ater*). The red-winged blackbird (*Aegolius phoeniceus*) is common in cattail marshes as well as agricultural and rural residential areas. In large marshes, the redwing may be joined by, or excluded by, the yellow-headed blackbird (*Xanthocephalus xanthocephalus*).

Reptiles and Amphibians

The project area is higher in elevation than the ranges of most reptile species known to occur in Garfield County. Species most likely to occur include the western fence lizard (*Sceloporus undulatus*) and gopher snake (bullsnake) (*Pituophis catenifer*) in sagebrush or oakbrush shrublands and pasture margins and the western terrestrial garter snake (*Thamnophis elegans*) along the Colorado River and other moist drainages. Other reptiles potentially present along the river are the milk snake (*Lampropeltis triangulum*) and smooth green snake (*Opheodrys vernalis*). All of these species are predatory, feeding primarily on insects, small mammals, eggs or nestlings of ground-nesting songbirds, depending on the size of the particular reptile species.

Amphibians potentially occurring along the Colorado River and in overbank surface waters on the floodplain include the tiger salamander (*Ambystoma tigrinum*), Woodhouse's toad (*Bufo woodhousii*), and northern chorus frog (*Pseudacris triseriata*) in addition to the northern leopard frog (see the section on Special Status Species). The three non-special-status species breed primarily in small ponds, slow-flowing streams, or inundated wetlands—including seasonally inundated areas and perennial waters devoid of predatory fishes. Following breeding, adults may move into nearby habitats to feed. Water quality requirements of these species are lower than those for the northern leopard frog and include waters with high turbidity and warm temperatures, but not highly alkaline or saline waters.

Environmental Consequences

Proposed Action

The Proposed Action would result in the initial loss of 96.5 acres of vegetation, of which more than half is considered severe winter range or winter concentration areas for deer and elk. Approximately 86% of the proposed pipeline parallels existing ROWs that already contribute to habitat fragmentation across the landscape. With the proposal, the existing corridors would become 50 feet wider. The project would adhere to seasonal restrictions that prohibit construction activities from December 1 through April 30. Pipeline installation is anticipated to occur from May through November. As a result, the project should have minimal impacts to the ability of deer and elk to use the general area along the ROW and in nearby habitats.

Avoidance of areas with otherwise suitable forage and cover would result in effective habitat loss. However, the amount of direct or indirect habitat loss associated with the Proposed Action would be minor in comparison to the overall availability of suitable habitat in the vicinity. Although some individuals would be subject to physiological or behavioral stress and potentially reduced survivorship or reproductive success, population-level impacts are not expected to be significant.

An additional potential impact on wildlife of the Proposed Action is the introduction and spread of weeds. Invasion by weeds has become an increasingly important concern associated with surface-disturbing activities in the West. Roads often act as a conduit for their spread, particularly unpaved roads for which imported roadbase and gravel may contain large numbers of weed seeds associated with the areas where they were mined. Weeds often outcompete native plants, rendering an area less productive as a source of forage for wildlife. Implementation of the mitigation measures in the section on Invasive Non-Native Species would minimize the potential for invasion and establishment of weeds in the project area.

Construction and reclamation of the ROW would convert existing shrub-dominated communities to grass- and forb-dominated communities, with shrubs planted in any areas found to be supporting Harrington's penstemon. Conversion of shrubby habitats would reduce foraging, reproduction, and sheltering habitat for a number of species, including the black bear. Because no long-term human occupancy of the ROW would occur, few long-term indirect impacts associated with the project would reduce the availability and suitability of habitats. A protective surface-use COA (Appendix A) would be included to manage trash during construction and reduce the potential for conflicts with bears.

No Action Alternative

Under this alternative, the portion of the pipeline on BLM-administered public lands would be denied, presumably resulting in cancellation or postponement of the project. Therefore, no project-related increases in potential impacts from hazardous or solid wastes would be expected.

Analysis on Public Land Health Standard 3 for Plant and Animal Communities

According to both the Divide Creek and Rifle-West LHAs (BLM 2005, BLM 2009), the project area was meeting the standard, although extensive natural gas development is contributing to habitat fragmentation and invasion of noxious weeds and undesirable species throughout the landscapes.

Due to the intensity of uses and activities occurring in the landscape, including natural gas development, noxious weeds were common on a number of sites, particularly at the lower elevations. Other undesirable non-natives such as Kentucky bluegrass and common dandelion were fairly common in the mixed mountain shrub communities at middle elevations.

Surface disturbance associated with the Proposed Action has the potential to fragment wildlife habitat and encourage expansion and dominance of the site by invasive non-native species. Appendix A includes provisions to revegetate the disturbances with native species and to control noxious weeds. Consequently, once revegetation success has been achieved, the Proposed Action would not contribute to the failure of the area to meet Standard 3.

3.21 Summary of Cumulative Impacts

Historically, habitat loss or modification in the CRVFO areas has been characteristic of agricultural lands used for grazing or hay production, rural residential and small urban developments, and localized industrial impacts associated with the I-70 and railroad corridors. More recently, the growth of residential and commercial uses, utility corridors, oil and gas developments, and other rural industrial uses (e.g., mining of gravel along the Colorado River) has accelerated the accumulation of impacts in the area.

Cumulative impacts have included (1) direct habitat loss, habitat fragmentation, and decreased habitat effectiveness; (2) increased potential for runoff, erosion, and sedimentation; (3) expansion of noxious weeds and other invasive species; (4) increased fugitive dust from construction of oil and gas pads, roads, and pipelines and associated truck travel; (5) increased noise, especially along access and haul roads; (6) increased potential for spills and other releases of chemical pollutants; and (7) decreased scenic quality.

None of the cumulative impacts was described in the 1999 FSEIS (BLM 1999a) as significant, and while new technologies and regulatory requirements have reduced the impacts of some land uses. Nonetheless, the combination of past, present, and reasonably foreseeable future actions have had and would continue to have adverse effects on various elements of the human environment. The scale and rate of cumulative impacts cannot be predicted with certainty because of a variety of factors—technical, economic, and geopolitical—that affect not only oil and gas development but the general population growth and associated residential, commercial, and industrial development. In addition, most of the growth except for oil and gas and, to some extent, in recreational use occurs on private lands where mitigation measures designed to protect and conserve resources may not be in effect to the same extent as on BLM lands. Recent COGCC regulations have closed considerably the gap between the potential environmental impacts associated with development of private versus Federal fluid mineral resources.

The Proposed Action would contribute incrementally to the collective impacts to air quality, native vegetation, migratory birds, terrestrial wildlife, and visual resources. It is noteworthy that the CRVFO is also currently analyzing a project proposed by WPX Energy adjacent to the project area. Two 6-inch water lines include a 4.1 mile section that would parallel the proposed Kokopelli trench, plus an additional 0.6 miles of private land. The water lines would provide water delivery and collection capabilities to gas fields in this area and reduce water truck traffic. Construction of the water lines is proposed for 2012.

4. PERSONS AND AGENCIES CONSULTED

Encana Oil & Gas (USA) Inc.: Mike Herndon
 Colorado Oil & Gas Conservation Commission (COGCC)
 Grass Mesa Homeowners Association Board
 Garfield County Building and Planning Department
 Tribes: Ute Tribe (Uintah & Ouray Reservation): Chairwoman Irene Cuch; Southern Ute Indian Tribe:
 Chairman Jimmy Newton; Ute Mountain Ute Tribe: Chairman Gary Hayes
 U.S. Army Corps of Engineers: Travis Morse and Mark Gilfillan
 U.S. Fish and Wildlife Service: Creed Clayton

5. LIST OF PREPARERS AND INTERDISCIPLINARY TEAM REVIEW

Encana consultants who participated in resource to the BLM for review and revision are listed in Table 13. BLM personnel who participated in field surveys, review of reports prepared by Encana consultants, and preparation of the Final EA are listed in Table 14.

Table 13. Encana Consultants		
<i>Name</i>	<i>Company</i>	<i>Areas of Participation</i>
Lisa Sakata	PENDO Solutions	Project coordinator, EA preparation, NEPA review
Zach Perdue	PENDO Solutions	GIS analysis and support for resource specialists and EA
John Cater	Aztec Archaeological Consultants	Cultural resources and Native American Religious Concerns
Stephen Sandau	Intermountain Paleontological Consulting	Fossil Resources
Eric Petterson	Rocky Mountain Ecological Services	Wetlands and Waters of the U.S., Wildlife, Vegetation, and Weeds
Mark Carlson	Aspen Environmental Field Services	Encana liaison to the BLM

Table 14. BLM Interdisciplinary Team Authors and Reviewers		
<i>Name</i>	<i>Title</i>	<i>Areas of Participation</i>
Julie McGrew	Natural Resource Specialist	Project Lead, Access and Transportation, Recreation, Socio-Economics, Visual Resource Management
Allen Crockett, Ph.D., J.D.	Supervisory NRS/Phys. Sci.	Technical Review, NEPA Review
Judy Perkins, Ph.D.	Ecologist/Botanist	Invasive Non-native Species, Special Status Plants, Vegetation
DJ Beaupeurt	Energy Lands/Realty Specialist	Rights-of-Way
John Brogan	Archaeologist	Cultural Resources, Native American Religious Concerns
Isaac Pittman	Rangeland Management Specialist	Range Management
Shauna Kocman, Ph.D., PE	Hydrologist	Soils, Air, Surface Water, Noise, Riparian and Wetland Areas
Sylvia Ringer	Wildlife Biologist	Migratory Birds, Special Status Fish and Wildlife, Aquatic and Terrestrial Wildlife
Todd Sieber	Geologist	Groundwater, Paleontology, Geology and Minerals

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APPENDIX A

Surface-Use Conditions of Approval

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STANDARD SURFACE-USE CONDITIONS OF APPROVAL

STANDARD COAS APPLICABLE TO ALL ACTIVITIES FOR THE PUMBA PIPELINE PROJECT

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

1. Administrative Notification. The operator shall notify the BLM representative at least 48 hours prior to initiation of construction. If requested by the BLM representative, the operator shall schedule a pre-construction meeting, including key operator and contractor personnel, to ensure that any unresolved issues are fully addressed prior to initiation of surface-disturbing activities or placement of production facilities.
2. Pipeline Construction and Maintenance. Construction methods, techniques and procedures described in the Encana Plan of Development shall be implemented (Encana 2011). The disturbance limits of the pipelines shall be staked and /or flagged prior to any commencement of operations. All trees and brush within the disturbance corridor shall be hydro-axed or chipped prior to beginning excavation work. Topsoil stripping shall not be allowed where topsoil windrowing or stockpiling is to occur along the pipeline corridor to retain the root mass of the brush species and enhance the recovery of the hydro-axed vegetation. No equipment or vehicle use shall be allowed outside the staked disturbance corridor of the pipeline ROW.
3. Dust Abatement. The operator shall implement dust abatement measures as needed to prevent fugitive dust from vehicular traffic, equipment operations, or wind events. The BLM may direct the operator to change the level and type of treatment (watering or application of various dust agents, surfactants, and road surfacing material) if dust abatement measures are observed to be insufficient to prevent fugitive dust.
4. Drainage Crossings and Culverts. Construction activities at perennial, intermittent, and ephemeral drainage crossings (e.g. burying pipelines, installing culverts) shall be timed to avoid high flow conditions. Construction that disturbs any flowing stream shall utilize either a piped stream diversion or a cofferdam and pump to divert flow around the disturbed area.
5. Jurisdictional Waters of the U.S. The operator shall obtain appropriate permits from the U.S. Army Corps of Engineers (USACE) prior to discharging fill material into waters of the U.S. in accordance with Section 404 of the Clean Water Act. Waters of the U.S. are defined in 33 CFR Section 328.3 and may include wetlands as well as perennial, intermittent, and ephemeral streams. Permanent impacts to waters of the U.S. may require mitigation. Contact the USACE Colorado West Regulatory Branch at 970-243-1199 ext. 15 (Mark Gilfillan). Copies of any printed or emailed approved USACE permits or verification letters shall be forwarded to the BLM.
6. Wetlands and Riparian Zones. The operator shall restore temporarily disturbed wetlands or riparian areas. The operator shall consult with the BLM Colorado River Valley Field Office and USACE to determine appropriate mitigation, including verification of native plant species to be used in restoration.
7. Reclamation. The goals, objectives, timelines, measures, and monitoring methods for final reclamation of oil and gas disturbances are described in Appendix I (Surface Reclamation) of the

1998 Draft Supplemental EIS (DSEIS). Specific measures to follow during interim and temporary (pre-interim) reclamation are described below.

- a. Reclamation Plans. In areas that have low reclamation potential or are especially challenging to restore, reclamation plans will be required prior to the COC 75103 ROW grant authorization. The plan shall contain the following components: detailed reclamation plans, which include contours and indicate irregular rather than smooth contours as appropriate for visual and ecological benefit; timeline for drilling completion, interim reclamation earthwork, and seeding; soil test results and/or a soil profile description; amendments to be used; soil treatment techniques such as roughening, pocking, and terracing; erosion control techniques such as hydromulch, blankets/matting, and wattles; and visual mitigations if in a sensitive VRM area.
- b. Deadline for Interim Reclamation Earthwork and Seeding. Reclamation, including seeding, of temporarily disturbed areas along roads and pipelines, and of topsoil piles and berms, shall be completed within 30 days following completion of construction. Any such area on which construction is completed prior to December 1 shall be seeded during the remainder of the early winter season instead of during the following spring, unless BLM approves otherwise based on weather. If road or pipeline construction occurs discontinuously (e.g., new segments installed as new pads are built) or continuously but with a total duration greater than 30 days, reclamation, including seeding, shall be phased such that no portion of the temporarily disturbed area remains in an unreclaimed condition for longer than 30 days. BLM may authorize deviation from this requirement based on the season, individual reclamation requirements for sensitive areas including sensitive plant species or ecological sites, and the amount of work remaining on the entirety of the road or pipeline when the 30-day period has expired.

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

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

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

If directed by the BLM, the operator shall implement measures following seedbed preparation (when broadcast-seeding or hydroseeding is to be used) to create small depressions to enhance

capture of moisture and establishment of seeded species. Depressions shall be no deeper than 1 to 2 inches and shall not result in piles or mounds of displaced soil. Excavated depressions shall not be used unless approved by the BLM for the purpose of erosion control on slopes. Where excavated depressions are approved by the BLM, the excavated soil shall be placed only on the downslope side of the depression.

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

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

- e. Seed Mixes. A seed mix consistent with BLM standards in terms of species and seeding rate for the specific habitat type shall be used on all BLM lands affected by the project (**Attachment 1 of the letter provided to operators dated April 6, 2012, provided at the end of this Appendix**). Note that temporary seeding no longer allows the use of sterile hybrid non-native species.

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

In areas where Harrington’s penstemon occurs, a revised seed mix shall be used, as described under the Site Specific COAs for the Pumba Pipeline.

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

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

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

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

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

- h. Erosion Control. Cut-and-fill slopes shall be protected against erosion with the use of water bars, lateral furrows, or other measures approved by the BLM. Cut-and-fill slopes along drainages or in areas with high erosion potential shall also be protected from erosion using hydromulch designed specifically for erosion control or biodegradable blankets/matting, bales, or wattles of weed-free straw or weed-free native grass hay. A well-anchored fabric silt fence shall also be placed at the toe of cut-and-fill slopes along drainages or to protect other sensitive areas from deposition of soils eroded off the slopes. Additional BMPs shall be employed as necessary to reduce soil erosion and offsite transport of sediments.
 - j. Monitoring. The operator shall conduct annual monitoring surveys of all sites categorized as “operator reclamation in progress” and shall submit an annual monitoring report of these sites to the BLM by **December 31** of each year. The monitoring program shall use the four Reclamation Categories defined in Appendix I of the 1998 DSEIS to assess progress toward reclamation objectives. The annual report shall document whether attainment of reclamation objectives appears likely. If one or more objectives appear unlikely to be achieved, the report shall identify appropriate corrective actions. Upon review and approval of the report by the BLM, the operator shall be responsible for implementing the corrective actions or other measures specified by the BLM.
- 8. Weed Control. The operator shall regularly monitor and promptly control noxious weeds or other undesirable plant species as set forth in the Glenwood Springs Field Office *Noxious and Invasive Weed Management Plan for Oil and Gas Operators*, dated March 2007. A Pesticide Use Proposal (PUP) must be approved by the BLM prior to the use of herbicides. Annual weed monitoring reports shall be submitted to BLM by **December 1**.
 - 9. Big Game Winter Range Timing Limitation. To minimize impacts to wintering big game, no construction, drilling or completion activities shall occur during a Timing Limitation (TL) period from **December 1 to April 30 annually**.
 - 10. Bald and Golden Eagles. It shall be the responsibility of the operator to comply with the Bald and Golden Eagle Protection Act (Eagle Act) with respect to “take” of either eagle species. Under the Eagle Act, “take” includes to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest and disturb. “Disturb” means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle; (2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or (3) nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior. Avoidance of eagle nest sites, particularly during the nesting season, is the primary and preferred method to avoid a take. Any oil or gas construction, drilling, or completion activities planned within 0.5 mile of a bald or golden eagle nest, or other associated activities greater than 0.5 miles from a nest that may disturb eagles, should be coordinated with the BLM project lead and BLM wildlife biologist and the USFWS representative to the BLM Field Office (970-876-9051).
 - 11. Raptor Nesting. To protect nesting raptors, a survey shall be conducted prior to construction, drilling, or completion activities that are to begin during the raptor nesting season (February 1 to August 15). The survey shall include all potential nesting habitat within 0.25 mile of a well pad or 0.125 mile of an access road, pipeline, or other surface facility. Results of the survey shall be submitted to the BLM. If a raptor nest is located within the buffer widths specified above, a 60-day raptor nesting TL will be applied by the BLM to preclude initiation of construction, drilling, and completion activities during the period of **April 1 to May 1**. The operator is responsible for complying with the MBTA, which prohibits the “take” of birds or of active nests (those containing eggs or young), including nest failure caused by human activity (see COA for Migratory Birds).

12. Migratory Birds. It shall be the responsibility of the operator to comply with the Migratory Bird Treaty Act (MBTA) with respect to “take” of migratory bird species, which includes injury and direct mortality resulting from human actions not intended to have such result. All mortality or injury to birds shall be reported immediately to the BLM project lead and to the USFWS representative to the BLM Field Office at 970-243-2778 x28 and visit <http://www.fws.gov/mountain-prairie/contaminants/oilpits.htm>.
13. Birds of Conservation Concern. Pursuant to BLM Instruction Memorandum 2008-050, all surface-disturbing activities are prohibited within potential habitat for nesting BCC species from **May 1 to July 1** to reduce impacts to Birds of Conservation Concern (BCC). An exception to this TL will be granted if nesting surveys conducted no more than one week prior to surface-disturbing activities indicate that no BCC species are nesting within 30 meters (100 feet) of the area to be disturbed. Nesting shall be deemed to be occurring if a territorial (singing) male is present within the distance specified above. Nesting surveys shall include an aural survey for diagnostic vocalizations in conjunction with a visual survey for adults and nests. Surveys shall be conducted by a qualified breeding bird surveyor between sunrise and 10:00 AM under favorable conditions for detecting and identifying a BCC species. This provision does not apply to ongoing construction, drilling, or completion activities that are initiated prior to May 1 and continue into the 60-day period at the same location.
14. Range Management. Range improvements (fences, gates, reservoirs, pipelines, etc.) shall be avoided during development of natural gas resources to the maximum extent possible. If range improvements are damaged during exploration and development, the operator will be responsible for repairing or replacing the damaged range improvements. If a new or improved access road bisects an existing livestock fence, steel frame gate(s) or a cattleguard with associated bypass gate shall be installed across the roadway to control grazing livestock.
15. Ips Beetle. To avoid mortality of pinyon pines due to infestations of the *Ips* beetle, any pinyon trees damaged during road, pad, or pipeline construction shall be chipped after being severed from the stump or grubbed from the ground, buried in the toe of fill slopes (if feasible), or cut and removed from the site within 24 hours to a location approved by the Colorado State Forest Service.
16. Fossil Resources. All persons associated with operations under this authorization shall be informed that any objects or sites of paleontological or scientific value, such as vertebrate or scientifically important invertebrate fossils, shall not be damaged, destroyed, removed, moved, or disturbed. If in connection with operations under this authorization any of the above resources are encountered the operator shall immediately suspend all activities in the immediate vicinity of the discovery that might further disturb such materials and notify the BLM of the findings. The discovery must be protected until notified to proceed by the BLM.

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

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

Pursuant to 43 CFR 10.4(g), the BLM shall be notified by telephone, with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, pursuant to 43 CFR 10.4 (c) and (d), activities shall stop in the vicinity of the discovery, and the discovery shall be protected for 30 days or until notified by the BLM to proceed.

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

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

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

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

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

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

18. Visual Resources. Existing woody vegetation outside the ROW corridor shall be preserved when clearing and grading for the pipeline corridor. The BLM may direct that cleared woody vegetation and rocks within the ROW corridor be salvaged and redistributed over reshaped cut-and-fill slopes and along the highly visible sections of the pipeline corridor to emulate the texture closer to that of the native landscape and to encourage vegetation growth.

To assist with revegetation, root systems shall be left in place where feasible and only removed in the trench construction. Above-ground facilities shall be painted **Shadow Gray** to minimize contrast with adjacent vegetation or rock outcrops.

19. Windrowing of Topsoil. Topsoil shall also be windrowed, segregated, and stored along pipelines and roads for later spreading across the disturbed corridor during final reclamation. Topsoil berms shall be promptly seeded to maintain soil microbial activity, reduce erosion, and minimize weed establishment.
20. Soils. Cuts and fills shall be minimized when working on erosive soils and slopes in excess of 30 percent. Cut-and-fill slopes shall be stabilized through revegetation practices with an approved seed mix shortly following construction activities to minimize the potential for slope failures and excessive erosion. Fill slopes adjacent to drainages shall be protected with well-anchored silt fences, straw wattles, or other acceptable BMPs designed to minimize the potential for sediment transport. On slopes greater than 50 percent, BLM personnel may request a professional geotechnical analysis prior to construction.

SITE-SPECIFIC COAS APPLICABLE TO THE PUMBA PIPELINE

1. Harrington's Penstemon. The Operator shall incorporate the following steps to avoid and minimize impacts to Harrington's penstemon:
 - a) Plant Surveys. Conduct pre-construction field surveys for Harrington's penstemon in late May/early June within the ROW shall include the following:
 - GPS, map, and stake higher density areas of Harrington's penstemon (greater than 6 plants per 100 square feet) to aid in planning avoidance and mitigation.
 - Adjust project design to minimize ROW widths through minor adjustments in alignment or use of stoveping and locate EWSs to avoid and minimize impacts to higher density stands.
 - b) Weed Control. Pre-treat noxious weeds in the survey area where Harrington's penstemon presence is confirmed prior to construction to minimize the threat to Harrington's penstemon in the area. The BLM Botanist shall be present to monitor the pre-treatment activities in survey areas where the presence of Harrington's penstemon is confirmed.
 - Obtain a Pesticide Use Permit (PUP), specific to Harrington's penstemon sites, from the BLM prior to any herbicide treatment of noxious weeds within occupied Harrington's penstemon habitat.
 - Limit noxious weed treatments within occupied Harrington's penstemon habitat to spot spraying or wicking. No broadcast spraying is permitted.
 - c) Sensitive Plant Mitigation. Submit payment of \$25,000 to the USDA Plant Materials Center in Meeker, Colorado, to cover the costs of seed collection in the impacted areas, seed cleaning and testing, nursery planting and 5 years of seed increase grow-out, cleaning and testing of produced seed, and field sowing of seed on reclamation sites. The seed for this nursery grow-out shall be collected, when ripe in the summer of 2012, from plants to be impacted within the pipeline corridor. If insufficient seed quantity is available, and if construction is postponed to a later date, return to the area in 2013 to collect additional seed from the area to be affected or, if the pipeline has been constructed, from nearby areas. The seed collector(s) must be approved by the BLM Botanist.

Mitigation planting sites shall be within the reclaimed pipeline corridor at or near the locations of impacted Harrington’s penstemon occurrences, or, if agreed upon by both the BLM and the operator, in wildlife habitat improvement sites occurring within Harrington’s penstemon habitat.

Within sections of the pipeline corridor occupied by Harrington’s penstemon, the seed mix shown in **Table A-1** shall be used instead of CRVFO’s standard menu-based seed mix.

Table A-1. Seed Mix for Initial Seeding of Harrington’s Penstemon Sites.¹				
<i>Common Name</i>	<i>Scientific Name</i>	<i>Variety</i>	<i>Season</i>	<i>Form</i>
Choose Five Grasses (50% of Total PLS)				
Bottlebrush Squirreltail	<i>Elymus elymoides, Sitanion hystrix</i>	VNS	Cool	Bunchgrass
Bluebunch Wheatgrass	<i>Pseudoroegneria spicata, Agropyron spicatum</i>	Secar, P-7, Anatone, Goldar	Cool	Bunchgrass
Indian Ricegrass	<i>Achnatherum [Oryzopsis] hymenoides</i>	Paloma, Rimrock	Cool	Bunchgrass
Needle and Thread Grass	<i>Hesperostipa [Stipa] comata</i>	VNS	Cool	Bunchgrass
Junegrass	<i>Koeleria macrantha</i>	VNS	Cool	Bunchgrass
Columbia Needlegrass	<i>Achnatherum nelsonii, Stipa columbiana</i>	VNS	Cool	Bunchgrass
Muttongrass	<i>Poa fendleriana</i>	VNS	Cool	Weakly Rhizomatous
Choose Three Forbs (30% of Total PLS)				
Arrowleaf Balsamroot	<i>Balsamorhiza sagittata</i>	Rocky Mountain Beeplant	<i>Cleome serrulata</i>	
Silverleaf Lupine	<i>Lupinus argenteus</i>	Scarlet Globemallow	<i>Sphaeralcea coccinea</i>	
Fernleaf Biscuitroot	<i>Lomatium dissectum</i>	Sulphur Flower Wild-Buckwheat	<i>Eriogonum umbellatum</i>	
Use One Shrub (20% of Total PLS)				
Fourwing Saltbush	<i>Atriplex canescens</i>			
¹ Harrington’s penstemon shall be broadcast seeded into formerly occupied areas using seeds from the Meeker Plant Materials Center when available. In addition, mountain big sagebrush (<i>Artemisia tridentata</i> spp. <i>vaseyana</i>) shall be broadcast seeded into the reclaimed area prior to snowfall using seeds collected along corridor.				

A minimum of five grass, three forb, and one shrub species shall be included in the seed mix initially installed by drill-seeding or hydroseeding (**Table A-1**). Seeding shall be at the rate of 60 pure live seeds (PLS) per square foot if drill-seeded and 120 PLS per square foot if broadcast-seeded or hydroseeded where drill-seeding is impracticable. If hydroseeding is used, application of seeds shall be performed as a separate step from application of hydromulch.

In addition, seeds of mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) shall be collected from plants in the vicinity of the pipeline corridor and seeded within 6 months of collection. Sagebrush seeding shall occur prior to winter snowfall, or on top of snow. Sagebrush may be sown either by broadcast seeding, or, if not on snowpack, by placing the seed in the fluffy seed box of a seed drill, with the drop tube left open to allow seed to fall out on the ground surface.

2. Fossil Resources. Due to the fossiliferous nature of the Green River and Wasatch Formations, a permitted paleontologist shall be present to monitor construction activities around MP 9, where a significant outcrop was identified in the field.
3. Range Management. *Grass Mesa Allotment Fencing and Steel Frame Gate Installation*. The proposed pipeline parallels an existing range fence that is planned for new alignment change in summer 2012. The existing fence along the pipeline ROW shall be removed and replaced along the BLM boundary as identified in **Figure A-1**.

Furthermore, the existing wire gate across the two-track road and pipeline corridor shall be relocated near the Grass Mesa Road and upgraded to a steel frame gate with supporting H-braces. Actual location of the new gate will be determined in the field by BLM. The new gate location is intended to be installed directly into the new 2012 BLM fence alignment planned along the Grass Mesa Road. Moving the gate to the new location will provide better vehicle control onto the reclaimed pipeline corridor and establish the gate for the new BLM allotment boundary fence. The steel frame gate with H-brace supports shall be installed across the existing 2-track which parallels the existing pipeline and near the Grass Mesa Road.

NEPA review was completed for the removal and replacement of the grazing allotment boundary fence in EA # DOI-BLM-CO-N040-2011-0058. Due to the availability of equipment in the area, Encana shall assist with the removal of vegetation via hydro-axe T7S R93W Section 4 and 9 to facilitate the BLM's range management projects in the area.

BLM shall provide Encana with a detailed map depicting the 3,000-foot by 5-foot vegetation clearing.

a. Vegetation Clearing

- i. A hydro-axe shall be used to clear a corridor approximately 5 feet wide for the new fence construction. Vegetation clearing shall only include areas of dense oakbrush.
- ii. The clearing shall be accomplished entirely on BLM lands.
- iii. The boundary shall be marked and flagged by BLM personnel prior to vegetation clearing.
- iv. Pursuant to BLM Instruction Memorandum 2008-050, all activities resulting in removal, injury, or mortality of vegetation shall be prohibited from May 15 to July 15 to reduce impacts to BCC species. An exception may be granted if nesting surveys indicate no nesting BCC species within 10 meters of the area to be disturbed.

b. Fence Construction

- i. All fencing materials, except the 16-foot gate, shall be provided by the BLM office in Silt, Colorado. Encana shall provide the labor and the 16-foot gate.
- ii. Two wire gates shall be installed at existing road crossings (**Figure A-1**).
- iii. Approximately 3,000 feet of new fence shall be constructed to the following specifications (**Figure A-2**).
 - o Fence type: Four strands barbed/smooth.
 - o Type of top wire: Smooth.
 - o Type of intermediate wires: Barbed.
 - o Type of bottom wire. Smooth
 - o Four-strand wire locations/dimensions in inches (spacing): Four Strand.
 - D: 12
 - C: 8
 - B: 6
 - A: 16
 - o Line post spacing (L): 16 feet, 6 inches.

- Ratio wood to steel line posts: 1 to 5
- Type of Stays: Wood or twist.
- Stay Spacing (1): 5 foot 6 inches.
- Length of wood posts (H_1): 8 or 7 feet
- Depth of wood posts in ground (h_1): 3 feet
- Length of steel posts (H_2): 5 feet, 6 inches
- Depth of steel posts in ground (h_2): To top of anchor plate.
- End Panel: Type I or II.

c. Fence Removal

- i. Approximately 3,000 feet of existing fence along the pipeline ROW shall be removed.
- ii. Reusable fence material shall be stockpiled in the open field in SWSW section 4.

4. Pipeline Construction and Maintenance. Construction methods, techniques and procedures described in the Pumba Plan of Development shall be implemented (Encana 2011). The disturbance limits of the pipelines shall be staked and /or flagged prior to any commencement of operations. All trees and brush within the disturbance corridor shall be hydro-axed or chipped prior to beginning excavation.

Topsoil stripping shall not be allowed beneath the area where topsoil windrowing or stockpiling is to occur. This requirement is intended to help retain the root mass of shrub species as a measure to enhance the recovery of hydro-axed vegetation.

No equipment or vehicle use shall be allowed outside the staked disturbance corridor of the pipeline right-of-way.

5. Private Landowners and Existing Rights-of-Way. The operator shall obtain agreements allowing construction with all existing authorized surface users of Federal ROW locations prior to surface disturbance or construction of the location, staging areas, or access across or adjacent to any existing ROW locations. In the case of privately owned surface, the operator shall certify to BLM that a Surface Use Agreement has been reached with the authorized surface user prior to construction.
6. Construction Coordination with Nearby Projects. During the pre-construction meeting for the Pumba Pipeline, Encana shall supply a projected work schedule itemizing the construction plans and time period (in weeks) that work would occur on BLM land in T7S R93W, Section 9. This notification is requested to gauge if other pipeline or well drilling plans involving these areas are also planned at the same time period. Should other construction projects be ongoing during the projected pipeline work, particularly pipeline trenching, pipe delivery and welding, coordination with other users shall be required to provide orderly traffic control and minimize impacts to nearby users and residents.

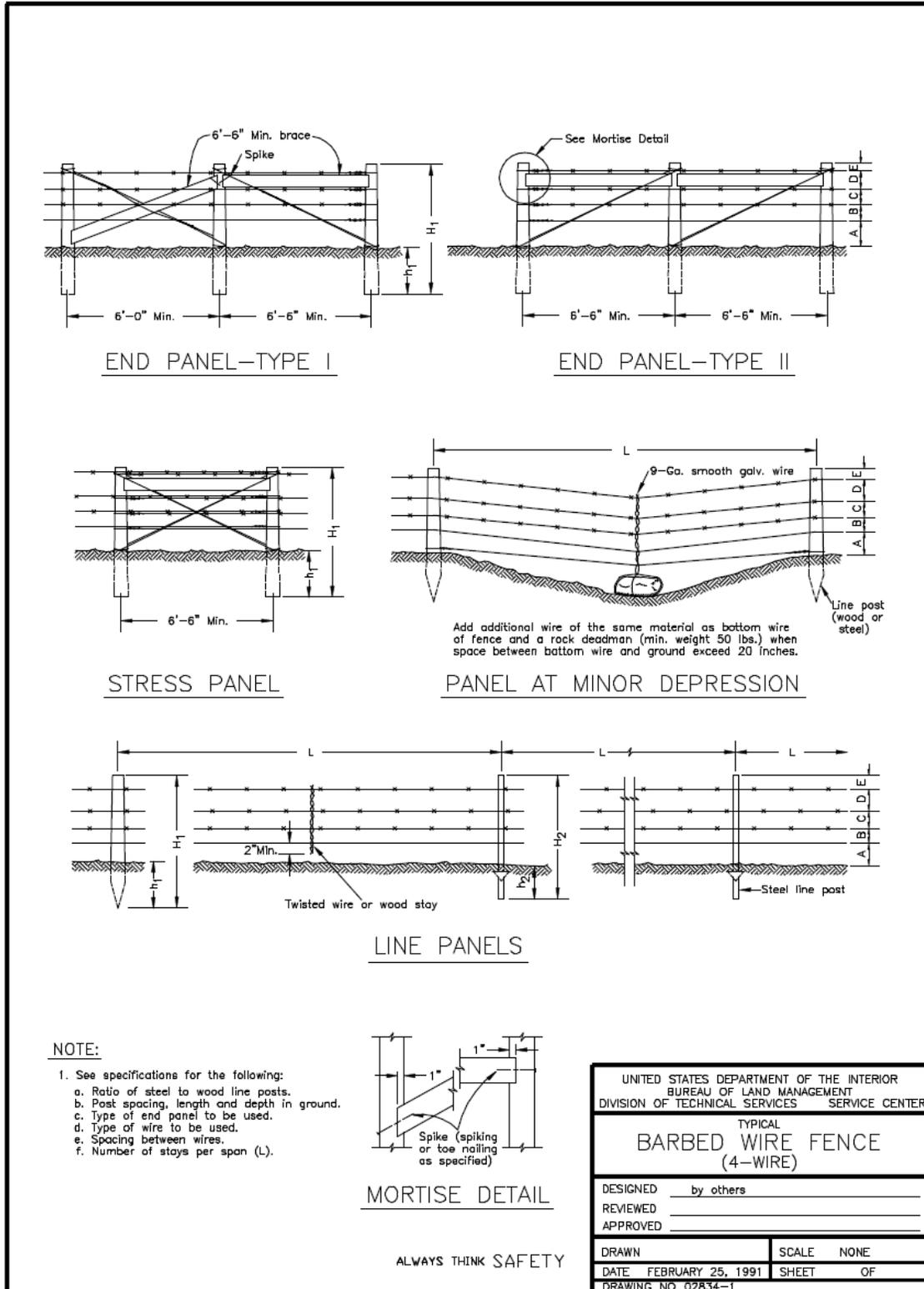


Figure A-2. Fence Specifications.

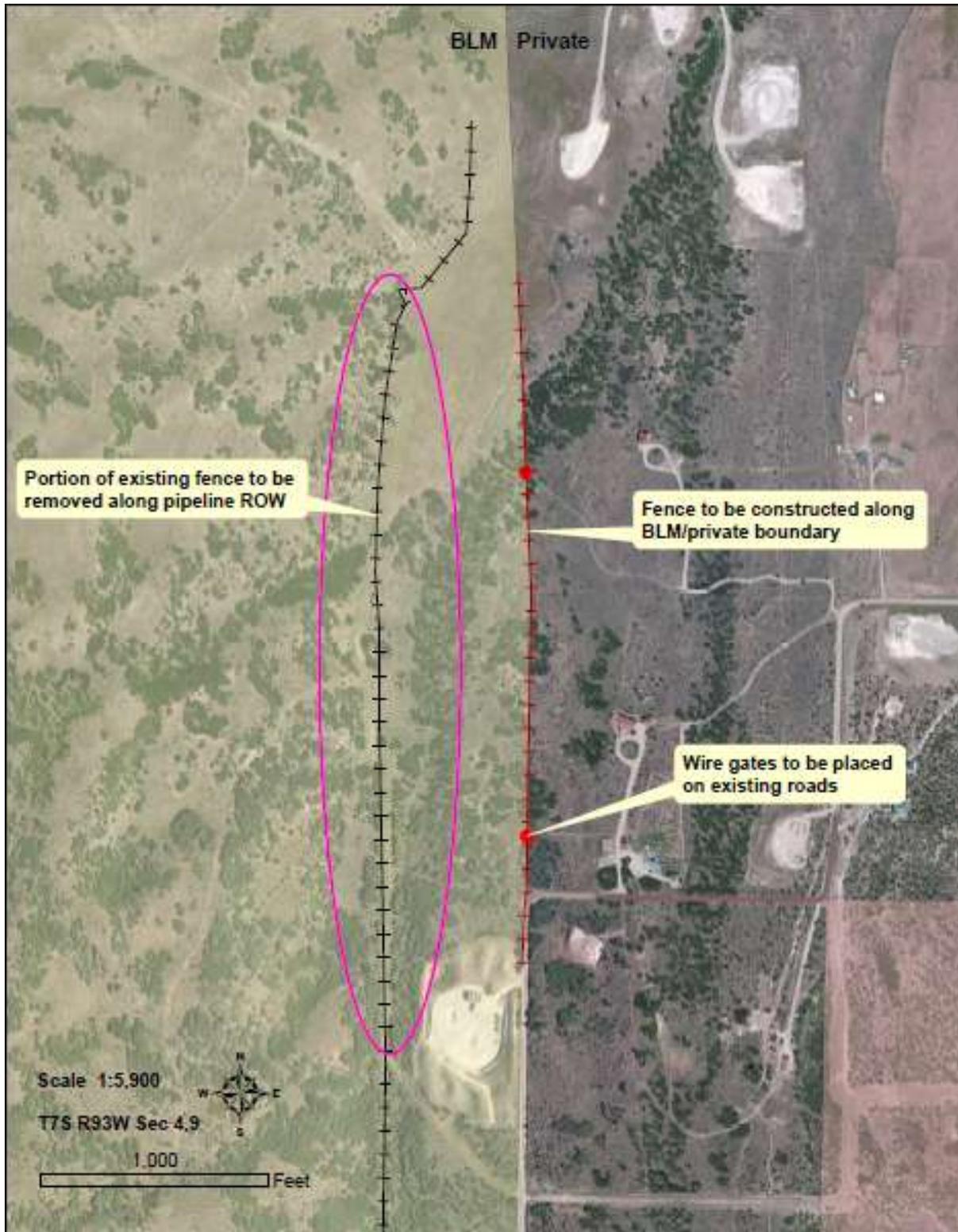


Figure A-2. Location of Wire Gates and Fence Along Pipeline ROW.

7. Treatment of Boulders. It is difficult to predict the amount of boulders that will be generated by the pipeline excavation work. However, boulders that are generated on the project shall be used to armor and line drainages, provide impediments to motorized travel onto or along the pipeline right-of-way, or in the vicinity of the Grass Mesa ditch, possibly used to line or armor the ditch course if that proves amenable to the parties. Boulders shall always be bedded into the ground with the white or lightest side of the rock face facing down or away from the viewing area. In certain instances, boulders shall be scattered across the pipeline disturbance corridor as directed by the BLM.
8. Noise and Traffic Calming. To mitigate noise impacts to recreational users in the area, Encana shall instruct its employees and contractors that use of engine braking by trucks serving the Williams oil and gas development is not allowed on BLM roads. To avoid conflicts with vehicular traffic accessing nearby private land, Encana shall implement signing and traffic control measures during pipeline construction. Encana shall obtain approved access and utility permits from Garfield County and shall adhere to Garfield County safety and maintenance requirements.

9. Visual Resources.

MP 2.75 to MP 6.5

Prior to construction, areas where dense vegetation will be cleared shall be identified and staked so that the adjacent vegetation can be thinned during pioneering of the pipeline corridor to soften the strong linear line created between new the construction and existing vegetation. The woody debris from the thinned areas shall be stockpiled for dispersing over seeded areas during interim reclamation. Areas identified for thinning and feathering of vegetation shall be designed to avoid areas containing populations of *Penstemon harringtonii*.

Rocks saved during construction shall be placed “white side down” on the pipeline corridor during interim reclamation to reduce the amount of color contrast with the surrounding landscape and to deter off-road travel. Rocks and woody debris shall be replaced on the pipeline corridor to emulate the texture closer to that of the native landscape and to encourage vegetation growth.

During construction, the BLM and Encana representatives shall jointly review construction measures to determine effectiveness in meeting visual resource mitigation measures, and if subtle changes in construction techniques are warranted.

MP 8 to MP 9.5

Rocks saved during construction shall be placed “white side down” on the pipeline corridor during interim reclamation to reduce the amount of color contrast with the surrounding landscape and to deter off-road travel. Rocks and woody debris shall be replaced on the pipeline corridor to emulate the texture closer to that of the native landscape and to encourage vegetation growth.

During construction, the BLM and Encana representatives shall jointly review construction measures to determine effectiveness in meeting visual resource mitigation measures, and if subtle changes in construction techniques are warranted.

10. Riparian and Wetland Area.

- a. The operator shall restore temporarily disturbed wetlands or riparian areas along Helmer Gulch and at the northern terminus of the bore beneath the Colorado River. Restoration shall address soils, vegetation, and water flow. The hydrology and hydraulics of the wetland system, including

surface and subsurface flow, shall be restored to preconstruction conditions as closely as possible. The operator shall consult with the BLM Colorado River Valley Field Office and USACE to determine appropriate mitigation, including verification of native plant species to be used in restoration.

- b. During pipeline construction, all dewatering structures and/or sediment bags shall be used to remove heavy sediments from discharges when dewatering.
- c. Spoil storage shall be kept out of the stream channel and behind temporary silt barriers to prevent impacts to wetlands.
- d. No staging or refueling areas shall be located within 300 feet of any wetland, or natural perennial or seasonally flowing stream or river, including both sides of the Colorado River bore site.
- e. No hazardous materials shall be stored within 300 feet of any wetland or natural perennial or seasonally flowing stream or river.
- f. The operator shall coordinate with the BLM and the surface landowner to minimize impacts of grazing to the Helmer Gulch channel until restoration of the disturbed areas has occurred. Methods required to reduce impacts may include coordinating with the surface landowner to temporarily reduce the use of the area and/or construction of a grazing exclosure fence around the restored area of Helmer Gulch.

GENERAL TERMS AND CONDITIONS OF THE RIGHT-OF-WAY GRANT (COC75103)

GENERAL TERMS AND CONDITIONS APPLICABLE TO ALL ACTIVITIES WITHIN THE PUMBA PIPELINE PROJECT (COC75103), DOI-BLM-CO-N040-2012-0035-EA

The following standard stipulations are applicable to all parts of the ROW, unless otherwise specified.

COMMON CARRIER: Common carrier provisions shall be applied, per **43CFR2885.11(b)** construct, operate, and maintain the pipeline as a common carrier. This means that the pipeline owners and operators must accept, convey, transport, or purchase without discrimination all oil or gas delivered to the pipeline without regard to where the oil and gas was produced (*i.e.*, whether on Federal or non-Federal lands).

1. Administrative Notification. The operator shall not initiate any construction or other surface disturbing activities on the ROW without prior written authorization of the BLM. Such authorization shall be a written *Notice to Proceed* (Form 2800-15). Any *Notice to Proceed* shall authorize construction or use any as therein expressly stated and only for the particular location or use therein described.
2. Preconstruction Meeting. The operator shall schedule and conduct a preconstruction meeting with BLM prior to the operator's commencing construction and/or surface disturbing activities on the ROW. The operator, its agent, its contractor(s), and other parties involved with construction and/or any surface-disturbing activities associated with the ROW shall attend this meeting to review the stipulations of the ROW grant, including the POD as applicable, as well as required safety regulations, if appropriate.
3. Gold Book Standards. The pipeline shall be installed to industry and BLM "Gold Book" standards. The pipeline(s) shall be buried with at least 36 inches of cover from the top of the pipe to the surface, and within the 50-foot ROW corridor. Overall construction width including the 25-foot temporary use permit, shall not exceed 75 feet except for those extra workspaces (EWSs) identified in the Proposed Action and noted on the plans. The centerline of the ROW and the exterior limits shall be clearly flagged prior to any construction activity.
4. Limits of Disturbance. The operator shall conduct all activities associated with the construction, operation, and termination of the ROW within the authorized limits of the granted ROW.
5. Saturated Soils Conditions. When saturated soil conditions exist on or along the proposed ROW prior to removal of vegetation or stripping of topsoil in an area, construction in that areas shall be halted until soil material dries out or is frozen sufficiently for construction to proceed without undue damage and erosion to soils.
6. Copy of Stipulations Maintained Onsite. A copy of these stipulations, including exhibits and the Plan of Development, if required, shall be kept on the project area and made available to persons directing equipment operation.
7. Utilities Locations. All existing pipelines, surface valves, and other utilities shall be field located, clearly marked, and the appropriate Utility Notification Center (www.unc.org) shall be notified before any construction/surface work occurs. All publicly owned underground facilities shall be marked according to the APWA color code.

8. Warning Signs. Pipeline warning signs shall be installed within 5 days of completion of construction and prior to use of the pipeline for transportation of product. Pipeline warning shall be installed at all road crossings and shall be visible from sign to sign along the ROW. For safety purposes each sign shall be permanently marked with the operator's name and shall clearly identify the owner (emergency contact) and purpose (product) of the pipeline.
9. Sanitary Site Conditions. Construction sites shall be maintained in a sanitary condition at all times; waste materials at those sites shall be disposed of promptly at an appropriate waste disposal site. "Waste" means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment. Disposal of all liquid and solid wastes produced during construction or operation of the pipeline shall be in an approved manner so as to not adversely affect the air, soil, water, vegetation, or wildlife.
10. Other Required Approvals and Permits. This authorization is contingent upon receipt of and compliance with all appropriate Federal, state, county and local, permits. The operator shall be responsible for obtaining all necessary environmental clearances and permits from all agencies (U.S. Army Corps of Engineers, Colorado Parks and Wildlife, U.S. Fish and Wildlife Service, Colorado Department of Transportation, Colorado Department of Public Health and Environment, Garfield County Road and Bridge, and City of Rifle) before commencing any work under this permit. Without all clearances and permits, this permit shall be not in effect. Operator shall assume all responsibility and liability related to potential environmental hazards encountered in connection with work under this permit.
11. Compliance with Federal Regulations. This grant amendment is issued subject to the holder's compliance with all applicable regulations contained in Title 43 Code of Federal Regulations parts 2800 and 2880.
12. Compliance with Laws. The operator shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the operator shall comply with the Toxic Substances Control Act of 1976 (TSCA), as amended (15 U.S.C. 2601 *et seq.*) with regard to any toxic substances that are used, generated by, or stored on the ROW or on facilities authorized under this ROW grant (40 CFR Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193). Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), Section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release of spill of any toxic substances shall be furnished to the BLM concurrently with the filing of the reports to the involved Federal agency or State government.
13. Hold Harmless Clause. The operator agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. 9601 *et seq.* or the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. 6901, *et seq.*) on the ROW (unless the release or threatened release is wholly unrelated to the operator's activity in the ROW). This agreement applies without regard to whether a release is caused by the operator, its agent, or unrelated third parties.
14. Paint Color. All above ground structures not subject to safety requirements shall be painted by the operator to the specifications of the BLM in order to meet the Visual Resource Management (VRM) requirements for the area.

15. As-Built Survey. An “as-built” center line survey of the right-of-way crossing Federal land, provided by a Certified Land Surveyor licensed to work in the State of Colorado, shall be provided to the BLM within 2 months of completion of the project.
16. Open Trenches. All open trenches shall be maintained in a safe condition to ensure no side-wall collapsing occurs and that all personnel, livestock, and wildlife are safe from falling into an open trench or being trapped or injured within the trenches.

Some protective systems may include (*Reference: OSHA 29 CFR 1926.650*):

- Shoring by installing supports to prevent soil movement for trenches that do not exceed 20 feet in depth.
- Shielding to protect workers by using trench boxes or other types of supports to prevent soil cave-ins.
- Always provide a way to exit a trench, such as a ladder or ramp, no more than 25 feet of lateral travel for personnel, livestock, or wildlife in the trench.
- Keep spoils at least 2 feet back from the edge of a trench.
- Make sure that trenches are inspected by competent personnel prior to entry and after any hazard-increasing event such as a rainstorm, etc.

Trenches adjacent to access roads and/or public or private dwellings shall be covered and/or warning barriers erected upon completion of daily construction or at any time personnel are not present on the construction site.

17. Welding of Pipeline. All wells shall be X-rayed 100% and reviewed and approved by a level 2 or 3 qualified inspector per 49 CFR 192. All welders shall be appropriately certified. (*Ref. 49 CFR 192.227, Qualifications of Welders*).
18. Fire Suppression. Welding or other use of an acetylene or other torch with open flame shall be operated in an area barren or cleared of all flammable materials at least 10 feet on all sides of equipment. Internal combustion engines must be equipped with approved spark arrestors which meet either (a) the USDA Forest Service Standard 5100-1a or (b) Society of Automotive Engineers (SAE) recommended practices J335(b) and J350(a).
19. Pipeline Testing. The entire pipeline shall be tested in compliance with DOT regulations (49 CFR Part 192). Incremental segments of the pipeline shall be filled to the desired maximum pressure and held for the duration of the test (8 hours minimum). (*Ref. 49 CFR 192.503.c*).

Notification to all nearby residents as well as the appropriate County Dispatch Center shall be made no less than 24 hours prior to the pressure test and blow down. All necessary and reasonable precautions shall be taken to ensure the safety of the employees and the general public, the lands, domestic animals and wildlife, etc. This may include, but not be limited to, restriction of access to the pipe being tested, temporary warning signs installed in appropriate locations, effective communication.

20. Notification of Other ROW Holders. The holder shall notify all existing ROW holders in the project area prior to beginning any surface disturbance or construction activities. It is the holder’s responsibility to coordinate with all other ROW holders and resolve any conflicts.

21. Restrictions on Onsite Materials Storage. The operator shall not store hazardous materials, chemicals, fuels, lubricating oils, or perform concrete coating activities within 200 feet of any water body or dry drainage. Equipment or vehicles that are crossing or working within 200 feet of water bodies shall not be refueled unless the Environmental Inspector gives a specific exception. If any hazardous material must be temporarily stored or transferred within 200 feet of a water body (i.e., stationary pumps), it must be placed within a secondary containment structure that is capable of containing 110 percent of the volume of the stored material.
22. Traffic Control. Appropriate precautions for traffic control on public lands shall be in place and conform to the guidelines of the “Manual on Uniform Traffic Control Devices (MUTCD): Temporary Traffic Control Elements”. A copy of the traffic control plan shall remain on site at all times during construction activities.
23. Survey Monuments. All survey monuments, witness corners, and/or reference monuments must be protected against destruction, obliteration, removal, or damage. Any damaged or obliterated markers must be reestablished in accordance with accepted survey practices at the expense of the holder.
24. Transportation/Road Maintenance. Commuting construction crews shall car pool to reduce the number of vehicle trips on local area roads and associated wear and tear. Operator shall ensure the commuting construction crews 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 as well as to reduce traffic related noise and air pollution.
25. Environmental Monitoring. Third-party Environmental Inspector(s) (EI) shall be retained by Encana to inspect the construction and pipeline contractors’ operations for compliance with all provisions of this plan. In addition, Federal, state, county, and local fire control agencies may perform inspections in areas under their jurisdiction and at their discretion.
 - a. The contractor shall inform all crews of requirements relating to resource protection. All construction personnel who operate ground-disturbing equipment will receive special instruction as to the types of possible environmental situations that may be encountered, including but not limited to, Threatened and Endangered (T&E) plant or wildlife species, erosion controls, wetlands, and other environmental concerns. They shall be aware of the correct the procedures to be followed if they encounter any concerns. All employees on the project shall be informed of the BLM’s and the EI’s authority to halt work. All personnel shall be informed that they are subject to prosecution for knowingly disturbing any environmentally sensitive species or areas. Violation may result in removal from the project and/or may result in civil or criminal penalties.
 - b. The EI shall document daily monitoring activities on appropriate daily monitoring report forms. Documentation may include digital photographs, as deemed appropriate. A copy of the daily report shall be delivered the BLM the following day, either in the form of a hard copy or electronically delivered.
 - c. The EI shall have a visible presence on the project. During construction, the EI shall observe and document environmental compliance, as well as actively identify and anticipate potential environmental compliance concerns ahead of construction.
 - d. Environmental and construction representatives shall interact daily and shall ensure that verbal discussions and written documentation are responsive at all times. All project personnel shall interact as frequently as necessary to ensure that environmental information, concerns, and issues requiring resolution are communicated in a timely manner. The EI shall represent the BLM

during environmental oversight and coordinate on a regular basis with the construction inspectors to ensure that they are aware of the status of environmental issues in their respective areas.

- e. If the EI has any concerns that are not being adequately addressed, the EI shall meet with the BLM to discuss the situation and determine what, if anything, needs to be addressed in order to maintain the appropriate environmental compliance.
- f. The holder shall not fire, lay off, or suspend the EI without prior permission of the BLM and shall not interfere with or attempt to influence the EI in his/her performance of the duties related to this project.

ATTACHMENT I.

MENU-BASED SEED MIXES BY HABITAT TYPE FOR USE IN INTERIM AND FINAL RECLAMATION (MAY 2008)

Table I-1. Low-Elevation Salt-Desert Scrub/Basin Big Sagebrush

Common Name	Scientific Names	Variety	Season	Form	PLS lbs/acre*
Plant Both of the Following (5% Each, 10% Total)					
Fourwing Saltbush	<i>Atriplex canescens</i>	VNS		Shrub	2.5
Shadscale	<i>Atriplex confertifolia</i>	VNS		Shrub	2.0
and Two of the Following (25% Each, 50% Total)					
Bottlebrush Squirreltail	<i>Elymus elymoides</i> , <i>Sitanion hystrix</i>	VNS	Cool	Bunch	3.4
Streambank Wheatgrass	<i>Elymus lanceolatus</i> ssp. <i>psammophilus</i> , <i>Agropyron riparium</i>	Sodar	Cool	Sod-forming	4.2
Bluebunch Wheatgrass	<i>Pseudoroegneria spicata</i>	Secar	Cool	Bunch	4.7
and One of the Following (20% Total)					
Indian Ricegrass	<i>Achnatherum [Oryzopsis] hymenoides</i>	Paloma, Rimrock	Cool	Bunch	3.7
Sandberg Bluegrass	<i>Poa sandbergii</i> , <i>Poa secunda</i>	VNS	Cool	Bunch	0.6
and One of the Following (10% Total)					
Alkali Sacaton	<i>Sporobolus airoides</i>	VNS	Warm	Bunch	0.15
Salina Wildrye	<i>Leymus salinus</i>	VNS	Cool	Bunch	1.0
and One of the Following (10% Total)					
Galleta	<i>Pleuraphis [Hilaria] jamesii</i>	Viva florets	Warm	Bunch/Sod-forming	1.6
Sand Dropseed	<i>Sporobolus cryptandrus</i>	VNS	Warm	Bunch	0.05

*Based on 60 pure live seeds (PLS) per square foot, drill-seeded. Double this rate (120 PLS per square foot) if broadcast or hydroseeded.

Table I-2. Pinyon-Juniper Woodland and/or Mountain/Wyoming Big Sagebrush Shrubland

Common Name	Scientific Names	Variety	Season	Form	PLS lbs/acre*
Plant Both of the Following (15% Each, 30% Total)					
Bottlebrush Squirreltail	<i>Elymus elymoides</i> , <i>Sitanion hystrix</i>	VNS	Cool	Bunch	2.0
Bluebunch Wheatgrass	<i>Pseudoroegneria spicata</i> , <i>Agropyron spicatum</i>	Secar, P-7, Anatone, Goldar	Cool	Bunch	2.8
and Two of the Following (20% Each, 40% Total)					
Thickspike Wheatgrass	<i>Elymus lanceolatus</i> ssp. <i>lanceolatus</i> , <i>Agropyron dasystochyrum</i>	Critana, Bannock, Schwendimar	Cool	Sod-forming	3.4
Slender Wheatgrass	<i>Elymus trachycaulus</i> , <i>Agropyron trachycandum</i>	Revenue, Pryor	Cool	Bunch	3.3
Western Wheatgrass	<i>Pascopyrum [Agropyron] smithii</i>	Rosana, Arriba	Cool	Sod-forming	4.8
and Two of the Following (15% Each, 30% Total)					
Indian Ricegrass	<i>Achnatherum [Oryzopsis] hymenoides</i>	Paloma, Rimrock	Cool	Bunch	2.8
Galleta	<i>Pleuraphis [Hilaria] jamesii</i>	Viva florets	Warm	Bunch/Sod-forming	2.5
Muttongrass	<i>Poa fendleriana</i>	VNS	Cool	Bunch	0.4
Sandberg Bluegrass	<i>Poa sandbergii</i> , <i>Poa secunda</i>	VNS	Cool	Bunch	0.4

*Based on 60 pure live seeds (PLS) per square foot, drill-seeded. Double this rate (120 PLS per square foot) if broadcast or hydroseeded.

Table 1-3. Mixed Mountain Shrubland, Including Oakbrush

Common Name	Scientific Names	Variety	Season	Form	PLS lbs/acre*
Plant Both of the Following (20% Each, 40% Total)					
Bottlebrush Squirreltail	<i>Elymus elymoides</i> , <i>Sitanion hystrix</i>	VNS	Cool	Bunch	2.7
Bluebunch Wheatgrass	<i>Pseudoroegneria spicata</i> , <i>Agropyron spicatum</i>	Secar, P-7, Anatone, Goldar	Cool	Bunch	3.7
and Two of the Following (15% Each, 30% Total)					
Thickspike Wheatgrass	<i>Elymus lanceolatus ssp. lanceolatus</i> , <i>Agropyron dasystachyum</i>	Critana, Bannock, Schwendimar	Cool	Sod-forming	2.5
Slender Wheatgrass	<i>Elymus trachycaulus</i> , <i>Agropyron trachycaulum</i>	San Luis	Cool	Bunch	2.5
Western Wheatgrass	<i>Pascopyrum [Agropyron] smithii</i>	Arriba, Rosana	Cool	Sod-forming	3.6
and One of the Following (10% Total)					
Big Bluegrass	<i>Poa ampla</i>	Sherman	Cool	Bunch	0.3
Canby Bluegrass	<i>Poa canbyi</i> , <i>P. secunda</i>	Canbar	Cool	Bunch	0.3
Muttongrass	<i>Poa fendleriana</i>	VNS	Cool	Bunch	0.3
and One of the Following (10% Total)					
Letterman Needlegrass	<i>Achnatherum [Stipa] lettermanii</i>	VNS	Cool	Bunch	1.7
Columbia Needlegrass	<i>Achnatherum [Stipa] nelsonii</i> , <i>Stipa columbiana</i>	VNS	Cool	Bunch	1.7
Green Needlegrass	<i>Nassella [Stipa] viridula</i>	Lodorm, Cucharas	Cool	Bunch	1.4
and One of the Following (10% Total)					
Indian Ricegrass	<i>Achnatherum [Oryzopsis] hymenoides</i>	Nezpar, Paloma, Rimrock	Cool	Bunch	1.9
Junegrass	<i>Koeleria macrantha</i> , <i>K. cristata</i>	VNS (North American origin)	Cool	Bunch	0.1

*Based on 60 pure live seeds (PLS) per square foot, drill-seeded. Double this rate (120 PLS per square foot) if broadcast or hydroseeded.

Table 1-4. Spruce-Fir Forest, Including Mountain Meadows

Common Name	Scientific Names	Variety	Season	Form	PLS lbs/acre*
Plant Both of the Following (20% Each, 40% Total)					
Mountain Brome	<i>Bromopsis [Bromus] marginatus</i>	Garnet, Bromar	Cool	Bunch	5.8
Slender Wheatgrass	<i>Elymus trachycaulus</i> , <i>Agropyron trachycaulum</i>	San Luis	Cool	Bunch	3.3
and Two of the Following (15% Each, 30% Total)					
Letterman Needlegrass	<i>Achnatherum [Stipa] lettermanii</i>	VNS	Cool	Bunch	2.6
Blue Wildrye	<i>Elymus glaucus</i>	VNS	Cool	Bunch	3.6
Idaho Fescue	<i>Festuca idahoensis</i>	Joseph, Nezpurs	Cool	Bunch	0.9
and Two of the Following (15% Each, 30% Total)					
Nodding Brome	<i>Bromus anomalus</i>	VNS	Cool	Bunch	2.7
Thickspike Wheatgrass	<i>Elymus lanceolatus ssp. lanceolatus</i> , <i>Agropyron dasystachyum</i>	Critana, Bannock, Schwendimar	Cool	Sod-forming	2.5
Big Bluegrass	<i>Poa ampla</i>	Sherman	Cool	Bunch	0.4
Wheeler Bluegrass	<i>Poa nervosa</i>	VNS	Cool	Sod-forming	0.4

*Based on 60 pure live seeds (PLS) per square foot, drill-seeded. Double this rate (120 PLS per square foot) if broadcast or hydroseeded.

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APPENDIX B

Public Comments and BLM Responses

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PUBLIC COMMENTS AND RESPONSES

A Public Notice requesting comments on the Proposed Action was published in the Rifle *Citizen Telegram* and the Glenwood Springs *Post Independent* on January 17, 2012. Public Notices were also mailed directly to Grass Mesa Homeowners Association Board members on January 17, 2012. In addition, the notice was posted on the Bureau of Land Management (BLM), Colorado River Valley Field Office (CRVFO) website. The 30-day public comment period expired on February 15, 2012. Following is a summary of the comments and responses. Copies of the letters are included at the end of this Appendix.

Colorado Parks and Wildlife (CPW) – Letter from J.T. Romatzke, Area Wildlife Manager, Dated January 20, 2011

Comment: *Much of the pipeline route falls within severe or critical winter range for mule deer and elk. Minimizing disturbance to mule deer and elk between December 1 and April 15 to encourage maximum use of winter range is of great importance to CPW. CPW strongly supports completing construction of the pipeline before the end of November and preferably before big game rifle hunting season begins in October.*

Response: With the exception of the planned Colorado River bore work, a standard 5-month big game winter timing limitation from December 1 through April 30 would be enforced for all construction activities on public land (BLM) associated with the Pumba Pipeline.

Comment: *Beaver Creek is designated cutthroat trout habitat. CPW requests that Encana take necessary precautions not to disturb the riparian habitat adjacent to Beaver Creek and to avoid critical life stages of cutthroat trout in June, July, and August.*

Response: The ROW associated with the Pumba Pipeline is approximately 375 feet from Beaver Creek at its closest point. The riparian habitat adjacent to Beaver Creek would not be affected by this project.

Comment: *Development of a new pipeline in previously undisturbed habitat has the potential to create a significant amount of habitat fragmentation. Prior to pipeline development, Encana should establish baseline vegetation conditions and inventories to provide a basis for post-development habitat restoration to mimic pre-disturbance conditions.*

Response: The referenced baseline inventory has been conducted and is summarized in a Biological Report for the Pumba Pipeline prepared by Rocky Mountain Ecological Services, Inc. (RMES) in December 2011. The report provides assessments of vegetation, soils, plants and wildlife species including sensitive species, noxious weeds, and waters of the United States.

Comment: *CPW would like to see grazing management practices that support reclamation efforts to include reductions or elimination of grazing at reclamation sites, fencing of reclamation areas, and frequent moving of animals away from reclamation areas.*

Response: As outlined in the Vegetation and Range Management sections of the EA, the expected reclamation of the proposed pipelines would occur in a manner that does not warrant eliminating grazing or requiring fencing of reclamation areas. Historically, the disturbed sites along adjacent or nearby pipelines have successfully re-vegetated within the outlined 3 to 5 year timeframe described in the impact analysis.

Comment: *CPW would like the BLM to clarify and set a standard for “excessively deep ruts” and include the language in the COAs and that all Encana personnel, contractors, and subcontractors be informed and follow the terms of the COAs.*

Response: BLM has a condition of approval for saturated soil conditions that halts construction activities until soil dries or is frozen sufficiently for construction to proceed without undue damage or erosion to soils (Appendix A). Some rutting from wheeled and tracked equipment can be expected during construction, particularly during inclement weather. Knowing that the operator is required to fill the pipeline trench, rip and reshape the corridor to natural grade, spread the stockpiled topsoil, and apply seed with a crimped straw component across the area of disturbance, the saturated soil COA is expected to be sufficient.

Comment: *Streams and associated riparian areas are some of the most highly productive and valued wildlife habitats in Colorado. This project proposes to come within 400 feet of Beaver Creek. CPW recommends using the minimum right-of-way width where pipelines approach streams and riparian areas and retain as much native riparian canopy or stream bank vegetation as possible. Construction staging areas should not be located closer than 300 feet from any creek and entirely out of any riparian areas.*

Response: The 75-foot temporary (50-foot permanent) ROW associated with the Pumba Pipeline is approximately 375 feet from Beaver Creek at its closest point. The ROW parallels CR334 for approximately 0.25 mile. Based on this distance and implementation of BMPs, neither the stream nor the riparian habitat adjacent to Beaver Creek would be affected by this proposal. The pipeline would cross the Colorado River; however, the proposed crossing would be accomplished via boring under the river. No other perennial streams would be crossed by the pipeline.

Comment: *CPW requests notification of hazardous materials spills, especially those that occur near a riparian area.*

Response: Hazardous material spills on BLM land are reported to BLM Hazardous Materials Coordinator in Grand Junction, Colorado. A COA has been developed to outline the procedures in the event of a spill during construction or operation of the Pumba Pipeline. Reference the CERCLA COAs and reporting requirements in General Terms and Conditions section of Appendix A.

Comment: *CPW requests that any illegal activity related to wildlife be reported immediately.*

Response: Project inspectors will notify the operator and BLM whenever illegal activities are known or suspected to have occurred. Any hunting, fishing, or wildlife-related offenses would be reported to CPW.

Comment: *CPW’s first season big game rifle hunting season begins on October 1; county and BLM roads may see an increase in traffic due to hunters being in the field. CPW encourages Encana, contractors, and subcontractors to use extra caution when using secondary and back roads this time of year.*

Response: Agreed.

Trout Unlimited (TU) – Letter from Cathy Purves, Science and Technical Advisor, Dated February 15, 2012.

Comment: *TU requests that the timing of the crossing of the Colorado River must not occur during fish spawning season and the depth of burial must be greater than 36 inches and must include the new pipeline safety measures enacted by Congress.*

Response: The Pumba Pipeline alignment does not cross any fish-bearing streams or other perennial water bodies. The Colorado River would be bored using the horizontal directional drilling (HDD) technique. HDD is a pipeline installation method typically used to avoid disturbance of sensitive surface features, including water bodies and wetlands. Boring of the Colorado River would occur at depths likely too deep to impact surface waters (approximately 100 feet below the river channel). The entire pipeline would be tested in compliance with DOT regulations (49 CFR Part 192).

Comment: *TU requests at least a ¼ mile buffer at the Colorado River crossing. If the buffer is less than ¼ mile, TU requests that protective mat platforms be employed.*

Response: The northern bore terminus is located further than ¼ mile from the Colorado River. The southernmost bore location is just within ¼ mile (0.22 miles) of the Colorado River. The staging areas for the southern bore would be located on private land with a temporary disturbance footprint of 1,200-foot by 75-foot. This area would be located on top of Taughenbaugh Mesa within an irrigated field. Additional disturbance would occur south of the bore entry point where the pipeline trench would be located as identified on the Proposed Action map. There would be no impacts within the floodplain of the Colorado River. The Colorado River and its adjacent riparian corridor would not be impacted given the pipeline would be bored under the river.

Comment: *TU requests a buffer of 500 feet or more at wetland crossings and the use of mat platforms to protect important wetland habitat.*

Response: Jurisdictional wetlands, which are those hydrologically connected to Waters of the U.S., are found at the western end of the ROW on Helmer Gulch and at the northern terminus of the bore beneath the Colorado River. No other riparian or wetland areas were identified along the ROW, aside from wetlands and riparian areas along the Colorado River, which would be avoided by the bore. Utility line (including pipeline) crossings of these resources fall under U.S. Army Corps of Engineers (USACE) Nationwide Permit (NWP) 12. Appendix A of the EA includes protections for riparian and wetland areas. Because of the low quality of the two affected areas, the BLM does not agree that a 500-foot-wide buffer zone is appropriate.

Comment: *TU request that reclamation efforts that minimize compaction and weed infestation occur immediately upon completion of the pipeline, particularly at the Colorado River crossing, wetland crossing, and the nine drainage crossings. TU recommends reclamation practices that do not permanently remove streamside woody vegetation.*

Response: Reclamation plans, deadlines, monitoring, methodology and weed control are included as COAs in Appendix A. These include topsoil stripping, storage, and replacement; seedbed preparation, seeding preparation, mulch, and deadline for interim reclamation earthwork. No woody riparian vegetation would be removed during installation of the Pumba Pipeline.

Comment: *Trout Unlimited recommends that a reclamation monitoring plan for a minimum of five years following construction be included.*

Response: Reclamation plans, deadlines, monitoring, and methodology are included as COAs in Appendix A. The operator is required to conduct annual monitoring surveys of all sites categorized as “operator reclamation in progress” and to submit an annual monitoring report of these sites to the BLM by December 31 of each year. These sites range from recently contoured and seeded, to almost reclaimed. These sites are where most of the reclamation work is being done. These sites are also the priority for monitoring until reclamation objectives are met.

Comment: *TU recommends that sediment monitoring be conducted with a pre-disturbance water sampling in addition to monitoring during and after construction.*

Response: The Pumba Pipeline alignment does not cross any fish-bearing streams or other perennial water bodies. The 75-foot temporary (50-foot permanent) ROW associated with the Pumba Pipeline is approximately 375 feet from Beaver Creek at its closest point, on private lands. The ROW and extra workspaces are not planned in proximity to any water bodies. Therefore, water sampling procedures would not be required by the BLM.

Comment: *TU recommends that road upgrades be kept to a minimum, to minimize opportunities for increased sedimentation.*

Response: Encana would primarily use existing roads to gain access to the construction workspace. No road improvements would be required. Roads would be maintained to the original condition post-construction. In portions of the project that are not accessible from existing roads, travel lanes would be established within the ROW limits to allow traffic to flow between access roads. Dust abatement measures, erosion control, and reclamation BMPs to prevent or minimize sedimentation are included as COAs in Appendix A.

Comment: *TU recommends that disinfectant procedures be applied for control of all Aquatic Nuisance Species (ANS) and pathogens known to exist within water bodies along the pipeline corridor.*

Response: As noted above, the Pumba Pipeline does not cross any perennial water bodies, nor are any extra workspaces are planned in proximity to water bodies. Therefore, disinfectant procedures would not be required by the BLM.

Comment: *Discharge water from hydrostatic testing should not be allowed to enter any water body or wetland area even though it is within the same sub-basin as the water withdrawal. Surface water withdrawals should not be taken from stream systems that support native fishes, particularly during the low flow periods.*

Response: Hydrostatic testing requirements are mandated by COGCC. Garfield County requires the operator to disclose the volume of water and source of water final disposition. Water for hydrostatic testing would come from Encana's "Lake Fox" (T7S R93W Section 9), which is a lined containment constructed by Encana for storage of freshwater, not a natural water feature. Hydrostatic test water would be discharged on Encana property north of US6 (T6S R94W Section 13). This water would not enter a freshwater system.