

**ENVIRONMENTAL ASSESSMENT  
#CO-800-2009-043**

**KINDER MORGAN PROPOSED  
GOODMAN POINT DEVELOPMENT PROJECT**



**Project Applicant:  
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**Prepared for:  
U. S. Department of Interior  
Bureau of Land Management  
Canyons of the Ancients National Monument  
27501 Highway 184  
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# TABLE OF CONTENTS

1.0	INTRODUCTION .....	2
2.0	PROPOSED ACTION.....	6
2.1	Project Description .....	6
2.1.1	Project Location .....	8
2.1.2	Project Construction.....	8
2.1.3	Associated Action .....	14
3.0	NO ACTION ALTERNATIVE .....	15
4.0	ALTERNATIVES.....	15
4.1	Rationale for Development of the Proposed Action .....	15
4.2	Alternative Considered in 2008 Preliminary Environmental Assessment .....	16
4.3	Alternatives Considered and Analyzed in this EA .....	18
4.4	Alternatives Considered but Not Carried Forward .....	19
5.0	PURPOSE AND NEED FOR THE ACTION .....	19
5.1	Purpose and Need for the Proposed Development .....	19
5.2	Purpose of the Environmental Analysis Process.....	19
5.3	Decisions to Be Made.....	20
6.0	PLAN CONFORMANCE REVIEW.....	20
7.0	CONFORMANCE WITH STATUTES/OTHER REGULATIONS.....	21
8.0	AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES .....	22
8.1	Mitigation Measures vs. Design Criteria .....	24
8.2	Critical Elements .....	25
8.2.1	Air Quality .....	25
8.2.2	Areas of Critical Environmental Concern .....	27
8.2.3	Cultural Resources and Native American Religious Concerns.....	28
8.2.4	Invasive, Non-Native Species.....	43
8.2.5	Migratory Birds.....	45
8.2.6	Threatened and Endangered Species .....	47
8.2.7	Hazardous or Solid Wastes.....	48
8.2.8	Surface Water and Groundwater .....	49
8.3	Non-Critical Elements.....	53
8.3.1	Access .....	53
8.3.2	Fire.....	55
8.3.3	Geology and Minerals.....	56
8.3.4	Health and Safety .....	59
8.3.5	Law Enforcement .....	62
8.3.6	Noise .....	62
8.3.7	Paleontology.....	63
8.3.8	Rangeland Management.....	64
8.3.9	Recreation Resources.....	65
8.3.10	Socioeconomics.....	67
8.3.11	Soils .....	68
8.3.12	Sensitive Species .....	70
8.3.13	Vegetation.....	73
8.3.14	Visual Resources .....	75
8.3.15	Wildlife, Aquatic, and Terrestrial .....	86
9.0	UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS.....	88
9.1	Interrelation to Other Projects.....	88
9.2	Unavoidable Adverse Impacts.....	88
10.0	RESIDUAL IMPACTS .....	89

10.1	Irreversible Commitments.....	89
10.2	Irretrievable Commitments.....	89
11.0	CONSULTATIONS.....	89
12.0	REFERENCES.....	90

**List of Appendices**

**Appendix A: BLM Surface Use Conditions of Approval**

**Appendix B: BLM Fish and Wildlife Clearance Letter; Plant and Wildlife List**

**Appendix C: BLM Tribal Consultation**

**List of Figures**

Figure 1.	Project Vicinity Map .....	4
Figure 2.	Project Area Map .....	5
Figure 3.	Project Detail Map.....	11
Figure 4.	Surface Water Resources – Area Springs .....	50
Figure 5.	Existing Gas Wells.....	60

**List of Tables**

Table 1.	Lease summaries and legal descriptions for proposed well pad locations.....	3
Table 2.	Project design features – well pads and access roads/flow lines.....	7
Table 3.	Project design features – production line.....	7
Table 4.	Critical and noncritical elements affected by the Proposed Action. ....	23
Table 5.	Past, Proposed Action, Projected Future, and Cumulative Cultural Resource Information for Oil, Gas, and Carbon Dioxide Development Projects in Canyons of the Ancients National Monument. ....	42
Table 6.	BLM-approved seed mix for project reclamation.....	44
Table 7.	Existing wells located within a 1-mile and 5-mile radius of proposed project area.....	58
Table 8.	BLM sensitive species with potential to occur within the Dolores Public Lands Office Management area and/or the proposed project area.....	71
Table 9.	Summary of visual resource inventory class analysis.....	77
Table 10.	Individuals consulted and area of responsibility.....	90

## ACRONYMS AND ABBREVIATIONS

ACEC	Areas of Critical Environmental Concern
ACMUA	Anasazi Culture Multiple Use Area
APDs	Applications for Permits to Drill
APE	Area of Potential Effect
bbls	barrels
BLM	Bureau of Land Management
CANM	Canyons of the Ancients National Monument
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CNHP	Colorado Natural Heritage Program
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
COA	Conditions of Approval
COGCC	Colorado Oil and Gas Conservation Commission
CPIF	Colorado Partners in Flight
dba	decibels (acoustic)
DPLO	Dolores Public Lands Office
EA	Environmental Assessment
Ecosphere	Ecosphere Environmental Services
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
FONSI	Finding of No Significant Impact
GIS	geographical information system
GP	Goodman Point
H <sub>2</sub> S	hydrogen-sulfide gas
Kinder Morgan	Kinder Morgan CO <sub>2</sub> Company, LP
kV	kilovolt

## ACRONYMS AND ABBREVIATIONS (Continued)

NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO <sub>x</sub>	nitrogen oxides
NRHP	National Register of Historic Places
NSO	No Surface Occupancy
OAHP	Office of Archaeology and Historic Preservation
OHV	off-highway vehicle
Proposed Action	Proposed Kinder Morgan Goodman Development Project
RMP	Resource Management Plan
RMRCC	Rocky Mountain Regional Coordinating Committee
ROS	Recreation Opportunity Spectrum
ROW	Right-of-way
SHPO	State Historic Preservation Officer
SOPA	Schedule of Proposed Actions
SOPA	Schedule of Proposed Actions
SWD	Salt Water Disposal
The Monument	Canyons of the Ancients National Monument
UIC	underground injection control
USC	U.S. Code
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
Woods Canyon	Woods Canyon Archaeological Consultants

United States Department of the Interior  
Bureau of Land Management  
Canyons of the Ancients National Monument  
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## ENVIRONMENTAL ASSESSMENT

### KINDER MORGAN PROPOSED GOODMAN POINT DEVELOPMENT PROJECT

<b>PROJECT SPECIFICATIONS</b>	
<b>EA NUMBER</b>	<b>CO-800-2009-043</b>
<b>CASE FILE/PROJECT NUMBER</b>	<b>CANM 07-006</b>
<b>PROJECT NAME</b>	<b>Goodman Point Development Project</b>
<b>ECOREGION/PLANNING UNIT</b>	<b>Canyons of the Ancients National Monument/San Juan/San Miguel Resource Area</b>
<b>LEGAL DESCRIPTION</b>	<b>T. 36 N., R. 18 W., secs 2 and 3; T. 37 N., R. 18 W., secs 33 and 34, Montezuma, County</b>
<b>APPLICANT/OPERATOR</b>	<b>Kinder Morgan CO<sub>2</sub> Company LP</b>

## 1.0 INTRODUCTION

Kinder Morgan CO<sub>2</sub> Company, LP (Kinder Morgan) is planning to further develop the McElmo Dome Unit by drilling new carbon dioxide (CO<sub>2</sub>) source wells and installing additional CO<sub>2</sub> collection and transportation facilities for development of the mineral resources. Kinder Morgan has submitted Applications for Permits to Drill (APDs) for six (6) CO<sub>2</sub> gas wells and associated well tie and production pipelines on lands administered by the Bureau of Land Management (BLM) in Montezuma County, Colorado. The wells would be drilled on a mesa top area near the eastern boundary of Canyons of the Ancients National Monument (the Monument) known as Burro Point. The proposed project would include approximately 18,350.89 feet/3.5 miles of production pipeline within the boundaries of the Monument.

The proposed wells would develop mineral resources associated with existing Federal leases (see Table 1) in the McElmo Dome Unit approximately 15 miles west-northwest of Cortez, Colorado. The legal descriptions for the proposed wells are provided in Table 1. The surface locations of the proposed wells are all within the Monument, with the surface use and subsurface mineral estate managed by the BLM.

The six (6) new wells are identified as the Kinder Morgan Goodman Point (GP) #20 through #25. The locations of the proposed wells, pipelines, and access roads are provided in Figures 1 and 2. The wells would be drilled with a combination of vertical and diagonal (angle) drilling with horizontal completions. The six new wells would be drilled from three well pads, utilizing each pad for two wells. One of the well pads (GP #22 and #23 twinned well pad) would partially overlap the reclaimed well pad for the plugged and abandoned Shell Western-Woods Unit 32-37-18 #6 well and would not require a new road. The other two well pads would require new access roads and new well pad construction. The locations of the two new well pads were chosen at sites that would minimize resource damage and utilize existing access road infrastructure as much as possible.

The well pad locations were chosen to allow for maximizing production by installing a horizontal component to the well completion. By adding the horizontal completion component, each well had a potential increase of ~20% in CO<sub>2</sub> production. By maximizing production with this methodology, the number of wells, and associated surface disturbance, was reduced. The proposed locations were chosen to avoid overlap of the horizontal completion areas, thus maximizing the production for each of the wells while minimizing the amount of surface disturbance.

As proposed, the project includes the construction of two new well pads, clearing and expansion of a reclaimed well pad (16.13 acres for the three well pads), and associated access roads and flow lines (1,676 feet/0.96 acres) and a single production line (18,350.89 feet/10.53 acres). The initial surface disturbance for the proposed project would be 27.61 acres. The proposed project would include a short-term area of disturbance of 8.23 acres that would be reclaimed after project construction activities are completed. Areas of long-term disturbance (roads and well pads totaling 19.38 acres) would be reclaimed immediately if the wells are non-producers or when the wells are no longer productive. The gas flow lines would be constructed parallel to the proposed access roads. The proposed production line would be constructed parallel to an existing two-track dirt access road. The production line would be installed below grade for the majority

of the route, with two sections installed above grade. Details regarding the project construction and operation are provided in Section 2.0. Because the project is on an existing lease, no new Rights-of-Way (ROWs) would be required for the proposed project. If the wells were unproductive, all surface disturbances would be reclaimed and abandoned according to BLM specifications.

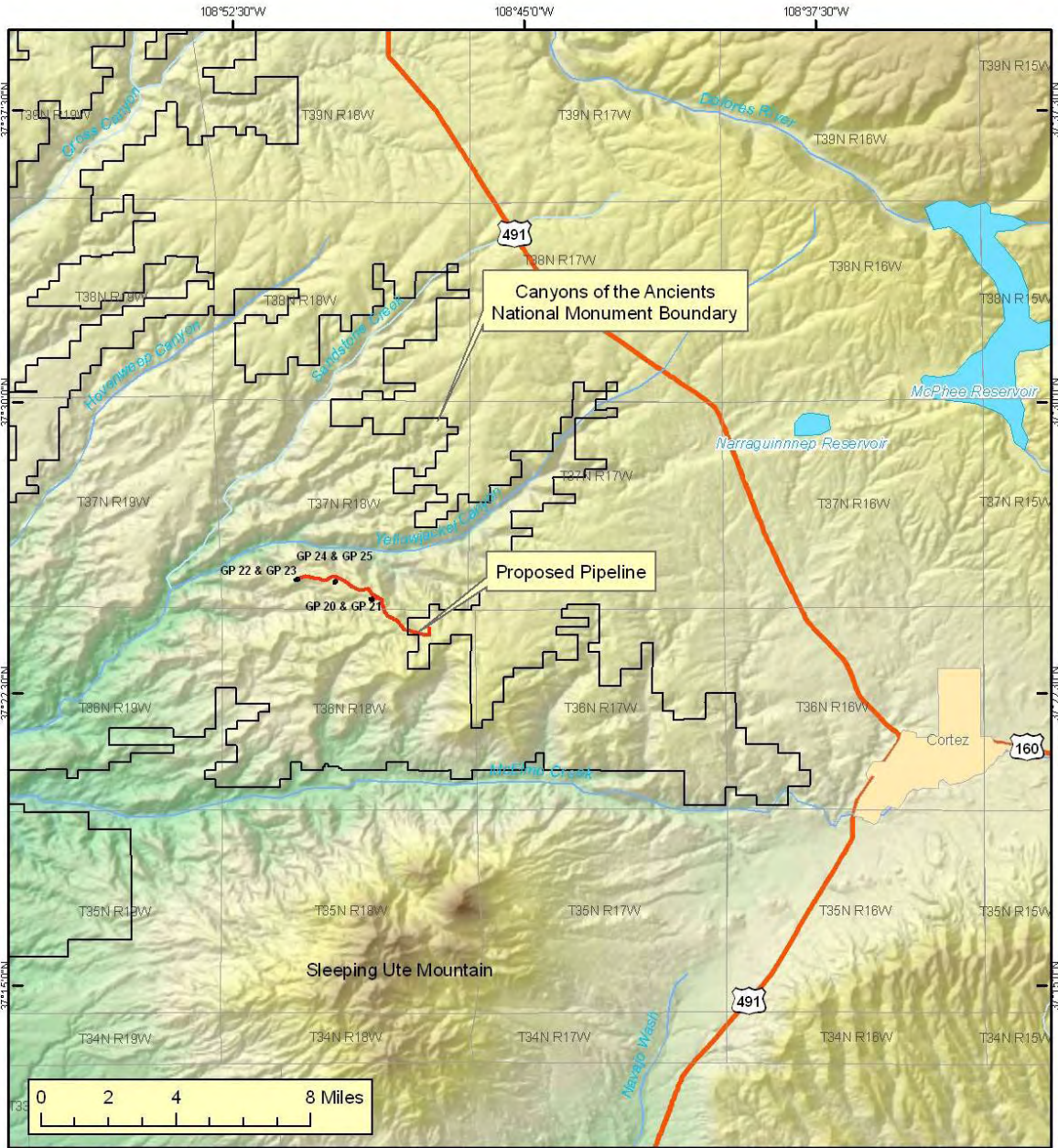
**Table 1. Lease summaries and legal descriptions for proposed well pad locations.**


<b>Well Name</b>	<b>Mineral Lease - Surface/Bottom Hole (Issue Date)</b>	<b>Lease Stipulations</b>	<b>Surface Location (Ownership)</b>	<b>Bottom Hole Location (Mineral Ownership)</b>	<b>Vertical Depth (feet)*</b>
GP 20	COC 012462/COC 012462 (1976)	Standard Lease Terms and conditions	T37N; R18W; S34; 853' FSL; 1,542' FEL (BLM)	T37N; R18W; S34; 1,514' FNL; 1,534' FEL (BLM)	11,153
GP 21	COC 012462/COC 012462 (1976)	Standard Lease Terms and conditions	T37N; R18W; S34; 798' FSL; 1,649' FEL (BLM)	T37N; R18W; S34; 774' FSL; 627' FWL (BLM)	11,153
GP 22	COC-022373 (4/1/71)/COC- 019464 (4/1/71)	Standard Lease Terms and conditions	T37N; R18W; S32; 1,482' FNL; 345' FEL (BLM)	T37N; R18W; S29; 1,518' FSL; 346' FEL (BLM)	11,153
GP 23	COC-022373 (4/1/71)/COC- 022373 (4/1/71)	Standard Lease Terms and conditions	T37N; R18W; S32; 1,544' FNL; 448' FEL (BLM)	T37N; R18W; S32; 721' FSL; 445' FEL (BLM)	11,153
GP 24	COC-019463 (4/1/71)/COC- 019463 (4/1/71)	Standard Lease Terms	T37N; R18W; S33; 1,629' FNL; 779' FEL (BLM)	T37N; R18W; S28; 1,371' FSL; 781' FEL (BLM)	11,153
GP 25	COC-019463 (4/1/71)/COC- 019463 (4/1/71)	Standard Lease Terms and conditions	T37N; R18W; S33; 1,716' FNL; 862' FEL (BLM)	T37N; R18W; S33; 1,716' FNL; 1,421' FWL (BLM)	11,153

**Note:**

\* Each of the proposed wells would have a 3,000 foot horizontal completion installed from the bottom hole location, at the vertical depth of the given well.

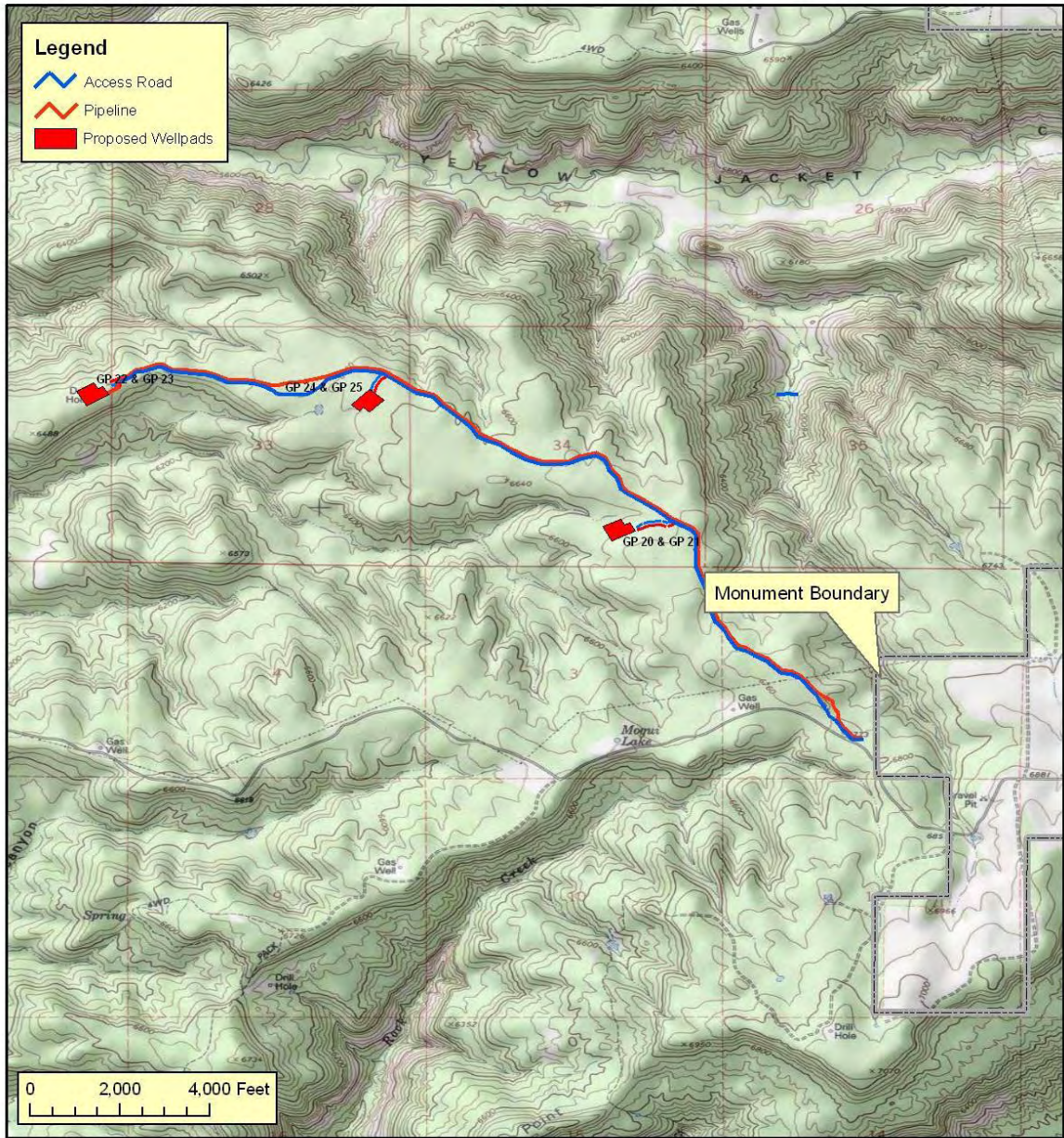


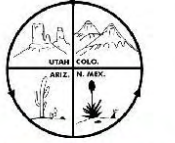


 <p><b>ECOSPHERE</b> ENVIRONMENTAL SERVICES</p>	<b>KINDER MORGAN</b>	
	GOODMAN POINT DEVELOPMENT PROJECT	
	FIGURE 1	PROJECT VICINITY MAP
	TOWNSHIP 37N RANGE 18W, SECTIONS 32, 33 & 34	MONTEZUMA COUNTY, CO
TOWNSHIP 36N RANGE 18W, SECTIONS 2 & 3	02/12/2009	

**Figure 1. Project Vicinity Map**





 <p><b>ECOSPHERE</b> ENVIRONMENTAL SERVICES</p>	<b>KINDER MORGAN</b>	
	GOODMAN POINT DEVELOPMENT PROJECT	
	FIGURE 2	PROJECT AREA MAP
	TOWNSHIP 37N RANGE 18W, SECTIONS 32, 33 & 34	MONTEZUMA COUNTY, CO
TOWNSHIP 36N RANGE 18W, SECTIONS 2 & 3	5/1/2009	

**Figure 2. Project Area Map**

An associated action with the project is the recompletion of the plugged and abandoned Kinder Morgan Well Sand Canyon #6 CO<sub>2</sub> well, and construction of a section of pipeline within an existing ROW. A summary of these components is provided in Section 2.1.3 of this Environmental Assessment (EA).

This EA for the proposed Kinder Morgan Goodman Development Project (Proposed Action) was prepared by Ecosphere Environmental Services (Ecosphere) as a third-party National Environmental Policy Act (NEPA) document preparer under contract to Kinder Morgan. BLM natural resource protection staff and the Monument Manager were consulted regarding the scope of analysis, the extent of potential impacts, and appropriate mitigation measures for resource protection. Kinder Morgan developed project-specific design criteria that would achieve the project purpose and need while providing project-specific environmental protection measures.

## **2.0 PROPOSED ACTION**

### **2.1 Project Description**

Kinder Morgan has filed Notices of Staking and APDs with the BLM-San Juan Public Lands Center and the Colorado Oil and Gas Conservation Commission (COGCC) to drill and develop six (6) CO<sub>2</sub> gas wells in the Burro Point area, within the Monument boundary in Montezuma County, Colorado. The wells would be drilled to the Leadville Formation of the McElmo Dome Unit under the terms of existing mineral leases with the BLM. The Notices of Staking were submitted in January 2009, and the APDs for the wells were submitted to the COGCC and the BLM in February 2009. As part of the mineral development activities, Kinder Morgan proposes to produce and transport the CO<sub>2</sub> gas in new well tie pipelines and a single production line. The proposed pipeline system would provide transport of the produced minerals from the proposed wells to a collection, compression, and treatment facility located on private land outside of the Monument boundary. A summary of the proposed construction activities is provided below, with additional details provided in Section 2.1.2. A summary of the area of disturbance (28 acres) for the proposed project activities is provided in Tables 2 and 3.

The proposed project includes construction of two new well pads, and utilization of an existing plugged and abandoned well pad, from which to drill the proposed wells. The two new well pads would require construction of access roads for drilling, and operation and maintenance of the wells. The proposed GP #22 and GP #23 wells would be constructed on a plugged and abandoned well pad (Shell Western-Woods Unit 32-37-18 6). A total of 1,676 feet of new road construction (see Table 2) within a 25-foot-wide construction corridor would be required for access to the new well pads. The proposed access roads would connect each well site to existing oil and gas infrastructure roads.

Once drilling and testing of the wells are completed, and the wells are deemed productive, they would be connected via construction of a flow line to a proposed CO<sub>2</sub> gathering system production line. The flow lines for each well would be constructed within the access road construction corridor area. The total length of flow lines would be the same as the total length of access roads (1,676 feet). The access road and pipeline width for all project components would be 25 feet. If the wells were unproductive, the well bore would be plugged and abandoned, and the well pad and access road would be reclaimed per the BLM conditions of approval.

**Table 2. Project design features – well pads and access roads/flow lines.**

Well Name	Access Road & Flow line Length/Acres Disturbed (25-foot-wide construction corridor)	Well Pad Area (Acres)	Temporary Use Area – would be reclaimed following construction (Acres)*	Total Affected Surface Area (Acres)**
GP #20	808 ft/0.46 ac	3.88	1.72	6.06
GP #21	0	0	0	0 (collocated with GP #20)
GP #22	370 ft/0.21 ac	3.88	1.35	5.44
GP #23	0	0	0	0 (collocated with GP #22)
GP #24	498 ft/0.29 ac	3.88	1.42	5.59
GP #25	0	0	0	0 (collocated with GP #24)
GP #26 (Associated Action)	2,280.83/0.43 ac	0	0	Pipeline only, located entirely within existing ROW area
Subtotals	1,676 ft/0.96 ac	11.64	4.49	
<b>Total disturbance from well pads/access roads/temporary use areas: 17.1 acres</b>				

Notes:

\*The area surrounding the well pad ‘footprint’ would be for temporary use during well pad construction only. All work would be performed within the area surveyed for archaeological and other resources.

\*\*The temporary use areas are from the area of disturbance on plats (surveyor) less the pad size (470 ft by 260 ft).

**Table 3. Project design features – production line.**

Production Line	Length/Area Disturbed (25-foot-wide construction corridor)	Location
<b>Production Line (Access road and production line route)</b>	18,350.89 ft/10.53 acres	T 37 N, R 18 W, Sections 33 & 34 and T 36 N, R 18 W Sections 2 and 3
<b>Private Land Section (associated action)</b>	4,097 ft/2.35 acres	T 36 N; R 18 W; Sections 1 and 2
<b>Sand Canyon #6 Production Line (associated action – within existing ROW area)</b>	2,280.83 ft/1.31 acres	T 36 N, R 18 W, Section 2
<b>Total disturbance from new production line on CANM: 10.53 acres</b>		

The proposed Goodman Point Development project would include installation of 18,350.89 feet/3.5 miles of production line on the Monument for connection of the wells to a central gathering location (compressor station) for treatment and delivery to out-of-state markets. The compressor station is located outside of the boundary of the Monument on private land owned by Kinder Morgan. The produced gas would be treated for removal of produced water at the compressor station. The production line would be constructed of steel pipe ranging in diameter from 10 inches at the beginning of the production line, telescoping up to 20 inches at the end of the production line. The diameter of the production pipeline would increase as the flow from additional wells is added into the production line.

Onsite field investigations of the well sites, flow line/access road routes, and production line route were conducted in October 2008, November 2008, and January 2009 by BLM natural resource specialists and Ecosphere Environmental Services biologists and natural resource specialists. Natural resource specialists from the BLM listed in Section 11.0 attended the onsite meetings. The onsite inspections were utilized to describe the project construction and operation plan to the BLM staff, and to identify potential areas of concern for natural resource protection staff. The onsite meetings identified cultural resources, visual resources, and wildlife resources as being potential areas of concern for the proposed project. In addition, alternative access routes and well pad locations were considered during the onsite inspections. Based on the field inspections, one of the alternative routes was eliminated from consideration (see Section 4.0).

Interim and final reclamation of the well pads, flow line/access road routes, and production line route would be required by the BLM. If both wells at a given well pad location would be deemed unproductive, the wells and well pad location would be abandoned and reclaimed in accordance with applicable BLM requirements stipulated in the Surface Use Conditions of Approval (COA) for the APDs. Reclamation efforts would continue until all related COA stipulations are met. The COAs for each well pad and flow line route, the proposed *Drilling Plan*, and *Surface Use Plan* are all part of the Proposed Action. If a well were produced, final reclamation would occur after the well is no longer economically productive (in an estimated 20 to 30 years). The productive period estimate is based on two factors: (1) the recoverable CO<sub>2</sub> in McElmo Dome is enough to sustain that type of production, and (2) the past history of existing CO<sub>2</sub> wells has shown that this type of production is what would be expected. Some of the first wells Shell Oil Company drilled in the early 1980s are still producing.

### **2.1.1 Project Location**

The proposed Goodman Point Development project CO<sub>2</sub> gas wells are located approximately 15 miles west-northwest of Cortez, Colorado, and within the eastern portion of the Monument (Figure 1). The proposed wells are entirely within Montezuma County, Colorado, and can be found on the Woods Canyon 7.5 minute U.S. Geological Survey (USGS) topographic quadrangle map (Figure 2). The legal description of the surface and bottom hole location for the proposed wells is provided in Table 1.

### **2.1.2 Project Construction**

The following descriptions of project design features (Tables 2 and 3) and construction practices are based on the surface use plans of each well site and the project plats.



Existing Infrastructure – There are two existing roads that provide access to the Burro Point area (see Figure 2). The main access road is a two-lane gravel road that provides general access to areas of the Monument and is administered by the BLM and maintained by Kinder Morgan. This road is a continuation of Montezuma County Road N. The access road to the northern flow line route and wells GP #20 through GP #25 is BLM Road 4724, an un-maintained gravel oil and gas access road.

Additional infrastructure in the Burro Point area includes an overhead 115 kilovolt (kV) electric transmission line owned and operated by Empire Electric Association, and an underground CO<sub>2</sub> production line that is owned and operated by Kinder Morgan. These two utility lines are located within ROW areas that generally parallel the main BLM access road.

Access Road Construction – New access roads would be constructed for two of the three proposed well pads (GP #20 and #21 twinned well pad and GP #24 and #25 twinned well pad). The last well pad (GP #22 and #23 twinned well pad) would partially overlap the reclaimed well pad for the plugged and abandoned Shell Western-Woods Unit 32-37-18 6 well. A summary of the access road lengths is provided in Table 2. The following project components would be constructed within the 25-foot-wide access road construction corridor: a 16-foot-wide driving surface; bar ditches along both sides of the driving surface; and a gas flow line (if the well is productive). The proposed access roads would be constructed according to specifications outlined in each well pad *Surface Use Plan*, in conformance with the BLM/U.S. Forest Service (USFS) “Surface Operating Standards for Oil and Gas Exploration and Development, The Gold Book” (BLM 2006), and per the engineering plans approved by the BLM.

There would be one section of the existing access road where the original road was constructed through a cultural resources site. For this section (see Figure 3, a geotextile fabric 16 feet in width would be installed on the existing access road, and a 12-inch gravel layer would be installed on the geotextile fabric to provide a driving surface.

A 1,100-foot section of the existing access road within the NE quarter of Section 33; T37N; R18W (see Figure 3) would re-routed to avoid cultural resource impacts. The existing section of road would be reclaimed by spreading brush over the surface. The new section of road would be constructed with gravel surface and a 16-foot-wide driving surface, with bar ditches on each side.

A summary of the proposed access road/flow line lengths, well pad areas, and temporary use areas for each of the proposed well pads is provided in Table 2.

Well Pad Construction – Each well pad location would be stripped of vegetation, leveled, and graded to provide a work area for the drilling activities. Stripped vegetation and topsoil would be segregated outside of the well pad work area but within the construction boundary limit. The vegetation and topsoil would be utilized for interim reclamation activities as described in the Plans for Surface Reclamation section below.

A surface cover of gravel would be applied in the primary work and parking areas in order to provide a safe working surface and to reduce the potential for wind and water erosion of site soils. Trailers for work and living space for the rig supervisor, tool pushers, mudloggers/

geologists, mud engineers, and safety personnel would be temporarily placed on the pad locations, within the area identified at each well pad for temporary use.

Well Drilling – The following is a brief summary of the proposed drilling activities for the Goodman Point Development project. Additional details are provided in the project *Drilling Plans* that are included with the APD package. The proposed drilling schedule for the project would be provided by Kinder Morgan.

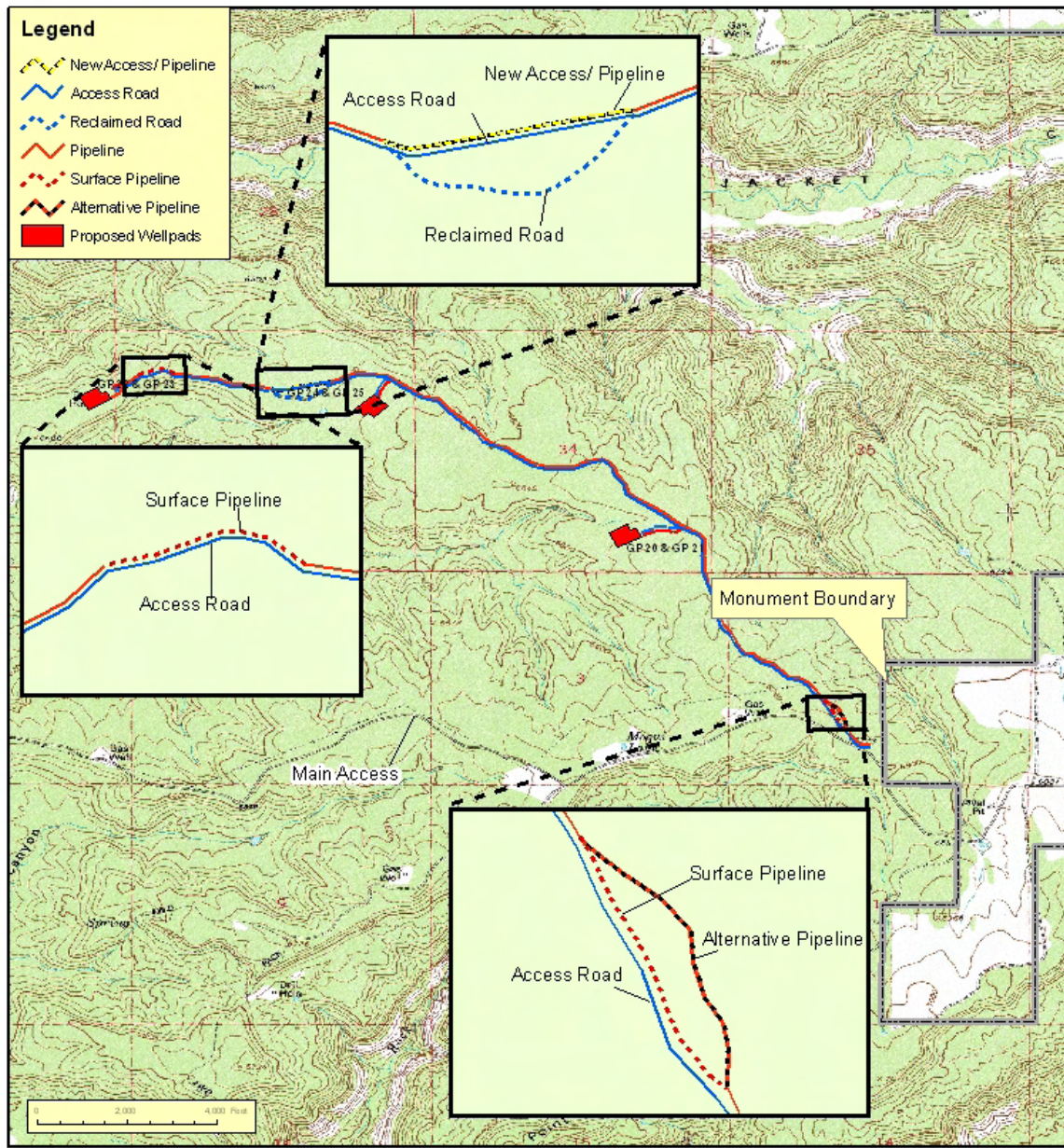
Two rig crews work on 12-hour shifts each and typically number five people per crew. The rig crews are typically onsite for 7 days, resting in onsite travel trailers while not working, then offsite for 7 days. Details regarding the specific drilling plans for each well are provided in the APD package submitted to the BLM in February 2009. The drill rig derrick is approximately 132 feet high during drilling operations.

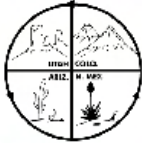
The salt/shale section located at ~5500 feet to ~7000 feet has a high risk associated with drilling a vertical hole through the shale due to swelling and sloughing. There are high concentrations of hydrogen-sulfide gas (H<sub>2</sub>S) encountered throughout this interval. The interval was named the “Killer Shale” by Shell Oil Company when they were developing this field.

Fresh water for drilling operations would be obtained and trucked from a private, off-lease source during construction and drilling. Trucked water would be discharged onsite to the freshwater reserve pit. Approximately 8,000 barrels (bbls) of water would be needed for the first drill location. Any leftover fresh water (following drilling) would be pumped from the pit and hauled to the next drill location (for the wells drilled in succession). It is estimated that another 2,000 bbls would be needed to supplement recycled water for each successive well. In total approximately 20,000 bbls or 2.57 acre-feet of fresh water would be estimated for use in the drilling process. The fresh water usage could vary depending on the severity of lost circulation during drilling.

Water generated during production testing would be discharged to a flow-back tank, where it would be collected by vacuum truck and hauled offsite to a permitted underground injection control (UIC) well. In addition to fresh water, salt water (brine) would be needed for drilling through the salt Paradox Formation at approximately 5,800 feet. The brine water would be purchased and hauled to the first well site from a private well in Bedrock, Colorado (20 miles west of Naturita). Approximately 4,000 bbls of brine water would be discharged onsite into the salt-water reserve pit for the first well pit. Any unused brine water would be recycled and hauled to the subsequent drill sites. It is estimated that an additional 1,500 bbls would be needed for each subsequent drill site to supplement the recycled brine water. In total, approximately 13,000 bbls or 1.67 acre-feet of brine water are estimated for use during the drilling of all the wells.

The water remaining at the end of the drilling program would be disposed of in the nearest Kinder Morgan disposal well, the Moqui Salt Water Disposal (SWD) well #1. It is estimated that approximately 1,000 bbls of fresh water and 2,000 bbls of brine would require disposal upon completion of the drilling operations.



 <p><b>ECOSPHERE</b> ENVIRONMENTAL SERVICES</p>	<b>KINDER MORGAN</b>	
	GOODMAN POINT DEVELOPMENT PROJECT	
	FIGURE 3	PROJECT DETAIL MAP
	TOWNSHIP 37N RANGE 18W, SECTIONS 32, 33 & 34	MONTEZUMA COUNTY, CO
TOWNSHIP 36N RANGE 18W, SECTIONS 2 & 3	5/8/2009	

**Figure 3. Project Detail Map**



Drilling fluids and mud additives would be re-circulated into the wells during drilling. Drill cuttings would be extracted from the drilling muds and placed in the reserve pit. The drilling fluids would be recycled whenever practical. Produced water or spent fluids would be allowed to evaporate in the reserve pit or would be hauled to a Class I non-hazardous disposal well.

Well Completion, Testing, and Operation – Production casing would be run and the well would be completed for production following drilling. Near surface aquifers would be cased off with a 9 5/8-inch diameter surface casing string set at 2,800 to 3,200 feet below ground surface and cemented to surface. All areas of the well pad not needed for production would be reclaimed once production commences (interim reclamation). Wireline logging at the end of drilling operations would be conducted in one day by one double-axle logging truck. The completion rig would be on location for approximately 4 weeks. The completion activities would include the vertical sections and the horizontal sections included at the bottom of each vertical boring.

Onsite Personnel – During the construction, drilling, completion, and operation of each well, the following personnel would be onsite for varying durations: Rig supervisor, tool pusher, mud logger (2), mud engineer (1), H<sub>2</sub>S safety technicians (2), and the regular rig crew (5) that work 12-hour shifts. Other personnel such as welders and mechanics may be at the site as needed. Other miscellaneous drilling and production staff, specialists, and consultants may also be needed. Due to safety concerns, all unnecessary personnel and vendors would be kept off these closed and gated locations. Onsite personnel each have a vehicle on location.

Transportation – Typically 25 tractor-trailer loads are required to move the bulk of the drilling equipment onto the surface location, and the same numbers of loads are required to relocate the drilling equipment from the location. Approximately 125 trips (total) per well are needed to supply water for drilling, plus two trips for fuel and four trips for cement. An additional 10 vehicle trips per day would be needed for transportation of crews to the site. Approximately 70 trips per well would be needed to relocate (first well) and dispose (final well) of fresh water and brine water after completion of drilling. Each well in the series would require approximately 10 trips to transfer fresh water and brine, and to provide make up water and brine. Solid waste and liquid waste would be disposed of once per week for a total of 24 trips per well. This would be a total of 565 vehicle trips per well. With two wells located on each pad, the drill rig equipment would not need to be moved from each pad until both of the wells are completed.

Site Access – As part of the Proposed Action, access to the Burro Point Mesa area would be closed to vehicle travel. A locked gate would be installed at the intersection of the Burro Point Mesa oil and gas access road with the main access road (see Figure 2). Keys to the gate would be provided to all permittees on the mesa and to the BLM. There would be a pedestrian/equestrian access point installed with the gate to allow for pedestrian and equestrian access to the mesa. There would also be a parking area installed at the intersection to allow for parking of vehicles. The controlled access to the project area would provide for protection of cultural and other resources from damage due to off-highway vehicle (OHV) travel.

Safety and Hazards – Safety and security are of primary concern to Kinder Morgan for all drilling and operations activities. One of the main safety hazards for drilling the proposed wells would be from possible releases of H<sub>2</sub>S during drilling and completion operations.

In order to assure that only personnel certified in H<sub>2</sub>S safety protocols and the use of specialized H<sub>2</sub>S safety and emergency equipment are permitted onsite, all well pad locations would be fenced and gated during drilling and completion operations. All personnel would be required to check in and out with the H<sub>2</sub>S safety supervisor upon arrival or departure from the site. All personnel would be required to wear H<sub>2</sub>S monitors on the outside of clothing when working in the project area. Finally, the drill rig would be equipped with several H<sub>2</sub>S monitors with audible and visual alarm systems to alert all project site personnel when H<sub>2</sub>S is present.

Kinder Morgan's H<sub>2</sub>S Safety Plan is provided in the APDs. Other standard industry safety policies would also be in effect during all operations at the well sites in an effort to prevent any accidents.

Flow Line and Production Line Construction – Should the wells prove productive, the flow lines would be constructed to transport the produced CO<sub>2</sub> from the well head to the area production line. A summary of the length and area of disturbance for the proposed access road/flow lines is provided in Table 2. A summary of the length on BLM and private land of the proposed production line is provided in Table 3. The production line construction would include both below-grade and above-grade installations; a summary of each type of installation follows.

As described previously, the flow lines and access roads would occupy the same construction corridor alignments. Typical construction consists of clearing the corridor, trenching the ditch to 5 or 6 feet, stringing and welding the pipe, and reclamation of the disturbed areas of the corridor.

The production line would be installed above grade (on the ground surface) for two sections of the production line route. The two sections of aboveground piping would have a total length of 1,474.3 feet/0.28 miles. The locations of the aboveground sections are shown on Figure 3. The east section of aboveground production line would provide protection to a single cultural resource site. This section of above-grade installation would include hand clearing of vegetation, placement of geotextile on the ground surface, placement of 12 inches of gravel on the geotextile, placement of concrete thrust blocks on the gravel at 20-foot intervals, and placement of the pipeline on the thrust blocks. The pipeline would be strapped to the thrust blocks to minimize movement of the pipeline during operation. The west section of the pipeline would be installed on the surface due to the presence of bedrock material. The pipeline would be anchored with thrust blocks set on the surface for this section.

The production lines would be constructed of steel lines ranging in diameter from 10 inches at the beginning of the production line, up to 20 inches at the end of the production lines. Pipeline valve boxes would be installed on the well pads. The valve boxes would have pipe guards installed around the boxes to protect the valves from traffic damage.

Additional details regarding construction activities and interim and final reclamation are provided in the *Surface Use Plans* prepared for the project submitted to the BLM with the APD package. A summary of the reclamation activities is provided in the Plans for Surface Reclamation section below.

Operation and Maintenance – Should the wells be productive, Kinder Morgan would own or have control of the following facilities on each location: the wellhead and associated equipment, and a short piece of aboveground piping to connect the well to a new underground flow line. The new flow lines would be combined in the new production line, which would transport the produced CO<sub>2</sub> to a treatment and compression facility located outside of the Monument boundary on private land. At the facility, separators would be used to remove production liquids from the gas stream, and compressors would be utilized to transport the treated “dry” gas to the Cortez Pipeline for transport to out-of-state markets.

Produced water from the proposed mineral development activities would be removed from the gas production stream at the offsite compression facility and disposed of in a permitted disposal well.

Normal-producing CO<sub>2</sub> well operation requires approximately weekly visits to monitor well production and pressure operations. Pipeline operations require monthly surface inspections and annual pressure testing of all the lines. All the well pads and pipeline routes would generally be inspected in a single day with a Kinder Morgan maintenance crew. Therefore, normal operations of the proposed production wells and pipelines would require 52 vehicle trips per year, on average.

Plans for Surface Reclamation – Interim reclamation of the unused portions of the well pad areas, the reserve pits, and pipeline routes would be completed after surface disturbance activities were completed and the proposed wells, production, and flow lines were operating. Interim reclamation activities would be completed as described in the project *Surface Use Programs* submitted to the BLM with the APD package. Interim reclamation activities would be completed on the temporary use areas around each well pad (4.49 acres total for the project), the flow line route portions of the construction corridors (0.35 acres), and the below-grade sections of the production line route (3.40 acres) for a total area of interim reclamation of 8.23 acres. Long-term disturbance associated with access roads and well pad areas would be 19.38 acres. All well pad locations would be reclaimed to approximately 1 acre, which would remain for the life of the well. Specific reclamation activities include: removal of all solid waste from the project site, spreading stockpiled topsoil over areas to be reclaimed, drilling or broadcasting native seed, mulching with cleared vegetation, replanting salvaged vegetation including cactus and yucca, and monitoring for revegetation success and noxious weed infestations.

After completion of the proposed project (when the wells are no longer productive), each well pad location and flow line route would be reclaimed according to BLM specifications provided in each approved APD’s Surface Use COA, and as proposed by Kinder Morgan in their *Surface Use Program* (see Appendix A). Final reclamation activities would include removal of facilities and waste, re-contouring abandoned sites, reseeding, and monitoring of re-vegetation efforts and noxious weed management. Kinder Morgan would contact the BLM within 48 hours of initiating final reclamation activities and upon completion of the final reclamation activities.

### **2.1.3 Associated Action**

Kinder Morgan is proposing to recomplete an existing plugged and abandoned well (Kinder Morgan Sand Canyon 2-36-18 #6) located approximately 1 mile south-southeast of the proposed GP #20 and #21 twinned well pad within the Monument (see Figure 2). No new disturbance

would be required for the drilling and recompletion activities. To transport the produced CO<sub>2</sub> gas from the Sand Canyon #6 location to retail markets, a flow line would be installed from the well head to the proposed production line for the Proposed Action wells. The flow line would be installed within an existing previously disturbed ROW area. The recompletion of the Sand Canyon 2-36-18 #6 well and the flow line installation would be permitted through submittal of a sundry notice to the BLM and the COGCC.

### **3.0 NO ACTION ALTERNATIVE**

The National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347, as amended) (NEPA) requires that a “no action” alternative be considered in all environmental documents. The Proposed Action involves Federal subsurface minerals that are encumbered with Federal oil and gas leases, which grant the lessee a right to explore and develop the lease. Although the BLM cannot deny the right to drill and develop the leasehold, individual APDs can be denied to prevent unnecessary and undue degradation. The no action alternative constitutes denial of the APDs associated with the Proposed Action.

### **4.0 ALTERNATIVES**

#### **4.1 Rationale for Development of the Proposed Action**

The Proposed Action has been proposed by Kinder Morgan to allow for development of the mineral resources present in the Burro Point area while minimizing environmental impacts to land surface resources. As part of the site evaluation process, archaeological, biological, visual and surface hydrological resources were considered prior to choosing the locations for each well pad, access road/flow line route, and production line route. Based upon an initial screening of the proposed project area and vicinity, the proposed project locations were chosen as representative of the locations that would least impact area resources while allowing development of the mineral resources.

In choosing each well pad and production line location, a number of factors were considered. The following steps were performed by Kinder Morgan in choosing the locations for the proposed wells. The overall sequence demonstrates the process Kinder Morgan used to minimize the environmental impacts of the Proposed Action.

Existing information and new archaeological inventory information was used to identify potential well locations that had the largest distance between site boundaries and construction limits. From this block survey, well pad locations were recommended to Kinder Morgan that would minimize impacts to archaeological resources. The production line routes also were surveyed for preferred routes that would minimize impacts to archaeological resources. Consideration was also given to location topography, the presence of arroyos or drainage channels, and the distance to existing access roads. Based on this screening method, a range of alternatives was considered for each location, and the preferred alternative was chosen as representing the least impact to the Monument resources.

## 4.2 Alternative Considered in 2008 Preliminary Environmental Assessment

The Goodman Point CO<sub>2</sub> Development Project was originally proposed (Notice of Staking submitted to the BLM) by Kinder Morgan in September 2006. Onsite field investigations of the project features were conducted in fall and winter 2006 and spring 2007. The onsite inspections were utilized to describe the project construction and operation plan to the BLM staff, and to identify potential areas of concern for natural resource protection staff. The onsite meetings identified cultural resources, visual resources, and wildlife resources as being potential areas of concern for the proposed project. The project features were partially modified to minimize resource impacts during the onsite meetings.

The Preliminary EA for the project was released for public comment in March 2008. A total of 13 comments were received by the BLM in the 30-day comment period. The comments focused on the following issues: cultural and visual resources analyses, range of alternatives and detail to support elimination of alternatives, and recommended mitigation measures.

The Monument consulted with 25 tribes (listed below) who have traditional ties to the Monument's landscape or are culturally affiliated to the Ancestral Puebloan culture group.

1. Acoma, Pueblo of
2. Cochiti, Pueblo of
3. Hopi Tribe
4. Isleta, Pueblo of
5. Jemez, Pueblo of
6. Jicarilla Apache Nation
7. Laguna, Pueblo of
8. Nambe, Pueblo of
9. Navajo Nation
10. Northern Ute Tribe
11. Picuris, Pueblo of
12. Pojoaque, Pueblo of
13. San Felipe, Pueblo of
14. San Ildefonso, Pueblo of
15. San Juan, Pueblo of
16. Sandia, Pueblo of
17. Santa Ana, Pueblo of
18. Santa Clara, Pueblo of
19. Santo Domingo, Pueblo of
20. Southern Ute Indian Tribe
21. Taos, Pueblo of
22. Tesuque, Pueblo of
23. Ute Mountain Ute Tribe
24. Zia, Pueblo of
25. Zuni Pueblo

Consultation for the Proposed Action considered in the 2008 Preliminary EA was initiated by a letter dated July 2, 2007, from the BLM to the Tribes. The letter notified the Tribes about the proposal, provided the cultural inventory information and the BLM's "adverse effect"

determination for the undertaking, requested identification of traditional cultural properties in the project area, and requested comments regarding the proposal.

The Tribes were also mailed the quarterly Schedule of Proposed Actions (SOPA) mailings for the San Juan Public Lands, and have access to the SOPA on the Internet (<http://www.co.blm.gov/nepa/sjplcnepa.htm>). Interested tribes were asked to contact the BLM to receive additional information concerning the project. This project was entered into the SOPA database on December 12, 2006.

Responses were received from the Pueblo of Laguna and the Hopi Tribe. The Pueblo of Laguna stated that “The Pueblo of Laguna has determined that the proposed undertaking will not have a significant impact at this time.” The Hopi Tribe’s response stated that the Hopi claim cultural affiliation to the prehistoric cultural groups in the Monument, that they did not concur with the recommended determination of “no effect” to historic properties, that they recommended an “adverse effect” determination, and they requested a meeting with the BLM to discuss their opposition to the project.

An administrative meeting was held with the Hopi Tribal representatives to discuss the project design features, the archaeological resources report, and the tribal concerns with the project. In a follow-up letter from the Hopi Tribal representatives, the following issues were identified:

- Asserts the Hopi claim of cultural affiliation to prehistoric groups in the Monument, and supports the identification and avoidance of prehistoric archaeological sites and traditional cultural places.
- Cites the contradiction of potential energy development within the Monument and within BLM special area designations (Mockingbird Mesa Cultural Resource Emphasis Area and the Anasazi Cultural Multiple Use Area of Critical Environmental Concern).
- States that the Hopi do not concur with the survey report recommendation that “The building of the project will have no effect on eligible cultural resources....”
- States the concern with the small avoidance buffers between site boundaries and construction areas.
- Asserts that the Hopi conclude that the proposal “will result in significant adverse effects to numerous cultural resources significant to the Hopi Tribe.”

Follow-up efforts to contact cultural resources staff for the Pueblos of Acoma and Zia were not successful in getting responses. The Pueblo of Zia Tribal Administrator, Peter Pino, spoke to Monument Manager LouAnn Jacobson, and stated that the Zia had no concerns about the project. A response dated October 15, 2007, from the Navajo Nation stated that the project will not impact any Navajo traditional cultural properties or historical properties.

The BLM determination of effect for the Proposed Action was “Adverse Effect” based upon the results of the inventory and the input received from the tribes. The Colorado State Historic Preservation Officer concurred with the BLM determination of “Adverse Effect.”

Based upon the results of the consultations, it was determined by the Monument Manager Monument Manager that:

- An adequate range of alternatives was not analyzed;
- Impacts to cultural resources were not adequately analyzed;
- Insufficient inventory had been completed to determine if the proposed locations would cause the least impacts to cultural resource values;
- Determination of adverse effect did not comply with Section 106 of the National Historic Preservation Act—
  - 38 eligible sites in close proximity to well locations;
  - Cultural significance to Hopi of both eligible and ineligible sites;
  - Need for mitigation via excavation contradicts Hopi desire for avoidance;
  - Lack of buffer zones and potential for subsurface materials;
  - Disruption of the visual and cultural landscape;
  - Impacts that interfere with the care and management of Monument objects;
  - Visual adverse effect to the landscape of the District.
- The Proposed Action would not satisfy the intent of the protection measures included in the Monument proclamation.

As a result, it was decided to revisit the Proposed Action with the project applicant to evaluate additional alternatives.

#### **4.3 Alternatives Considered and Analyzed in this EA**

The Kinder Morgan proposed Goodman Point Development Project has the following alternatives options for the development.

Alternative 1 – No Action (see Section 3.0)

Alternative 2 (Proposed Action) – This alternative would include construction of two new well pads and utilization of an existing plugged and abandoned well pad on the Burro Point mesa. The three well pads would include two wells located on each pad (twinned) for a total of 6 new wells. Each of the twinned well pads would have a single production line installed within the access road ROW and would connect to a single production line installed within the existing Burro Point access road. The production line would be installed with a combination of surface installation and below grade pipelines. The pipeline would be installed on the surface for areas of the line that cross through cultural resource sites and areas where blasting would be required to install the pipeline within sandstone bedrock. This alternative is described in Section 2.0.

Alternative 3 – This alternative would include the three well pads described in Alternative 2. For this alternative the proposed production line would be installed below grade for the entire route. The production line would be routed around a cultural resources site to avoid direct impacts to cultural resources. The alternate production line route would require an additional 817.2 feet of new construction as compared to the production line route in Alternative 2 (Proposed Action). Within a 25-foot ROW, the additional length of production line construction would potentially disturb a 0.47-acre area. The additional area of disturbance would occur due to the separation of the existing road from the production line route for the section around the cultural resources site.

#### **4.4 Alternatives Considered but Not Carried Forward**

The Proposed Action has been put forward by Kinder Morgan to allow for development of the mineral resources present in the Burro Point area while minimizing environmental impacts to land surface resources. As part of the site evaluation process, archaeological, biological, and visual and surface hydrological resources were considered prior to choosing the locations for each well pad, access road/flow line route, and production line route. Based on an initial screening of the proposed project area and vicinity, the proposed project locations were chosen as representative of the locations that would best protect area resources while allowing development of the mineral resources.

In developing the Proposed Action (Alternative 2), one additional proposal (Alternative 4) was considered at the request of tribal consultants. An alternate access route to the Burro Point mesa area was considered to access the proposed well pad locations. The production line from the wells would be installed within the ROW area for the new access route. This alternative was considered to evaluate the feasibility of constructing an access road that would avoid impacts to all cultural resources sites and buffer zones within the analysis area. Upon staking and surveying the route, additional cultural resource sites were discovered, and the route was determined to be technically infeasible. Therefore, Alternative 4 will not be carried forward in this EA.

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

#### **5.1 Purpose and Need for the Proposed Development**

The purpose of this project is to develop CO<sub>2</sub> while ensuring compliance with the Presidential proclamation that established the Monument, with the National Environmental Policy Act, with the 1985 San Juan/San Miguel Resource Management Plan and with Interim Guidance for managing the Monument. The action is needed to develop CO<sub>2</sub> resources for commercial marketing to the public.

#### **5.2 Purpose of the Environmental Analysis Process**

NEPA requires analysis of the potential environmental effects associated with Federal actions. The environmental analysis process is designed to provide the BLM's authorized Decision-maker with information needed to render a decision that is fully informed and based on factors relevant to the proposed Project, in compliance with BLM responsibilities under NEPA. It also documents the analyses conducted on the Proposed Action and alternatives to the Proposed Action in order to identify environmental impacts and mitigation measures necessary to address resource issues.

This EA is site-specific in nature; i.e., it describes environmental impacts resulting from development of the specific wells and associated facilities on Federal surface and mineral estates outside and within the McElmo Dome Unit. Due to the size and connected nature of the proposed development, a larger landscape scale analysis of environmental impacts was completed to allow for proper evaluation of this proposal's contribution towards cumulative impacts, especially to cultural resources in the Monument. The EA also provides a vehicle for disclosure of the Proposed Action, and the environmental effects for public review and comment.



If a decision is reached from this analysis that approves the APDs, no additional NEPA permitting actions would be required. If the Responsible Official determines that a Finding of No Significant Impact cannot be reached, an Environmental Impact Statement (EIS) would be required to further evaluate this proposal.

### 5.3 Decisions to Be Made

The Monument Manager would decide whether or not to approve these specific APDs. If the APDs are approved, the Monument Manager would also stipulate under what terms and conditions the Proposed Action may occur.

## 6.0 PLAN CONFORMANCE REVIEW

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

**Plan:** *San Juan/San Miguel Planning Area Resource Management Plan (RMP)*  
**Date Approved:** September 1985  
**Page Number:** Page 17 states “BLM actively encourages and facilitates the development by private industry of public land mineral resources so that national and local needs are satisfied and economically and environmentally sound exploration, extraction, and reclamation practices are provided.”

**Amendment:** *San Juan/San Miguel Resource Management Plan Amendment Record of Decision (1991)*. The Final Environmental Impact Statement (FEIS) is also known as the Amendment to the RMP.

**Date Approved:** October 28, 1991  
**Page Number:** Page 11 states that the objective is to “Facilitate orderly, economic, and environmentally-sound exploration and development of oil and gas resources using balanced multiple-use management.” Also, page 2-2 of the FEIS states that: “In addition to this EIS, an Environmental Assessment (EA) will be completed on each Application for Permit to Drill or group of APDs.”

The Proposed Action is also subject to conformance with the Presidential Proclamation that established the Monument (BLM 2000a), the BLM Interim Management Policy for BLM National Monuments and National Conservation Areas (BLM 2001a), the BLM Interim Management Guidelines for Canyons of the Ancients National Monument (BLM 2001b), and the BLM Interim Management Guidance for Oil and Gas Leasing and Development (BLM 2001c).

**Proclamation:** Monument Proclamation  
**Date:** June 9, 2000  
**Language:** “NOW, THEREFORE, I, the President of the United States of America, by the authority vested in me by section 2 of the Act of June 8, 1906 (34

Stat. 225, 16 U.S.C. 431), do proclaim that there are hereby set apart and reserved as the Canyons of the Ancients National Monument, for the purpose of protecting the objects identified above, all lands and interests in lands owned or controlled by the United States within the boundaries of the area described on the map entitled “Canyons of the Ancients National Monument” attached to and forming a part of this proclamation. The Federal land and interests in land reserved consist of approximately 164,000 acres, which is the smallest area compatible with the proper care and management of the objects to be protected.”

***Guidance:***

***Language:***

BLM Interim Management Guidelines for National Monuments Monument lands remain open to continued oil and gas (including carbon dioxide) development under existing leases, under current lease restrictions, and BLM regulations. The Proclamation also directs the Secretary to manage development, subject to valid existing rights, so as not to create any new impacts that interfere with the proper care and management of the objects protected by the Proclamation. With respect to oil and gas leases, “valid existing rights” vary from case to case, but generally involve rights to explore, develop, and produce within the constraints of the lease terms, laws, and regulations.

The Proposed Action would fulfill the objective and intent of the 1985 San Juan/San Miguel RMP that public land mineral resources be developed in an environmentally sound way, and thus is in conformance with the RMP. This EA is being utilized to determine conformance with the Monument Proclamation and Interim Guidance. A written decision by the Authorized Officer would include a decision on conformance.

## **7.0 CONFORMANCE WITH STATUTES/OTHER REGULATIONS**

Exploration and development of Federal oil and gas leases by private industry is an integral part of the BLM’s oil and gas leasing program under authority of the Mineral Leasing Act of 1920, as amended, the Mining and Minerals Policy Act of 1970 (30 U.S.C. 21), the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1761-1777), the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (30 U.S.C. 195 et seq.), and applicable BLM Onshore Oil and Gas Orders (43 CFR 3160).

BLM regulates oil and gas development so as to minimize environmental impacts to public lands as required by numerous Federal laws, including:

- The Endangered Species Act of 1973 (P.L. 94-325)
- The Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703-712)
- The Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. 668-668d)
- The Federal Water Pollution Control Act of 1948, as amended (33 U.S.C. Chap. 26)
- The Clean Air Act of 1963, as amended (P.L. 88-206)
- Clean Water Act of 1972, amended 1977
- The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 U.S.C. Chap. 103)

- The Antiquities Act of 1906, as amended (P.L. 52-209)
- The National Historic Preservation Act of 1966, as amended (P.L. 89-665)
- The Archaeological and Historic Preservation Act of 1974 (P.L. 86-253)
- The Archaeological Resources Protection Act of 1979, as amended (P.L. 96-95)
- The American Indian Religious Freedom Act of 1978, as amended (42 U.S.C. 1996)
- The Native American Graves Protection and Repatriation Act of 1990 (P.L. 101-601)
- Executive Order 12898 of 1994 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations"

This EA considers the requirements of these laws and implementing regulations, as applicable, as part of the Proposed Action. The Proposed Action, including associated applicant-committed mitigation measures, complies with the laws and implementing regulations indicated above.

### **Conformance with Colorado Standards for Public Lands Health**

In September 1997, Colorado BLM established standards for health of public lands in the state. The standards relate to all uses of public lands, and a finding for each standard must be included in each EA. The five standards for protecting Public Lands Health are:

- 1) Insure healthy upland soils;
- 2) Protect and improve riparian systems;
- 3) Maintain healthy, productive, native plant and animal communities;
- 4) Maintain or enhance threatened or endangered species and their habitats; and
- 5) Insure water quality meets minimum Water Quality Standards established by the State of Colorado.

The standards describe conditions needed to sustain public land health and relate to all uses of the public lands. The standards are applied on a landscape scale and relate to the potential overall health and sustainability of the landscape. Additional information on the standards and guidelines can be found at the Colorado BLM website: <http://www.co.blm.gov/standguide.htm>. Findings for each of the specific project study area standards (if applicable) are described in the relevant resource description in Section 8.0 below.

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

In this chapter, to comply with the Council on Environmental Quality (CEQ) requirements of analytic and concise environmental documents (40 CFR 1502.2), those resources identified as potentially affected by the Proposed Action or as a special concern are described. Table 4 provides a summary of critical elements and noncritical elements and their potential to be impacted by the Proposed Action. **Critical and noncritical elements identified as not potentially impacted by the Proposed Action are not discussed in this EA.**

Environmental resources may be affected in many ways during implementation of the Proposed Action. The effect, or impact, is defined as any change or alteration in the pre-existing condition of the environment produced by the Proposed Action, either directly or indirectly. Impacts can be beneficial to the resource (positive) or adverse (negative), and can be either long-term or short-term. Short-term impacts affect the environment for only a limited time (generally less than 5

years), and the environment generally reverts to the pre-project condition. Long-term impacts are defined as lasting longer than 5 years. Additionally, with long-term impacts, the environment would potentially not revert to pre-existing condition during the lifetime of the proposed project and beyond. For the purpose of this EA, potential impacts have been divided into three categories:

**High** –are impacts that are substantial in severity and therefore should receive the greatest attention in decision-making;

**Moderate** – impacts that cause a degree of change that is easy to detect and do not meet the criteria for high impacts; and

**Low** – impacts that cannot be easily detected and cause little change in the existing environment.

Implementation of the Proposed Action could potentially affect certain critical elements of the human environment, as defined by BLM NEPA guidance. These elements must, at a minimum, be considered in all EAs developed by the BLM and either analyzed or a no-effect declaration made. The status of the critical and noncritical elements for the Proposed Action is indicated in Table 4.

**Table 4. Critical and noncritical elements affected by the Proposed Action.**

Critical Elements*	Potentially Affected		Noncritical Elements	Potentially Affected	
	Yes	No		Yes	No
Air Quality	X		Access	X	
Areas of Critical Environmental Concern (ACEC)	X		Cadastral Survey		X
Cultural Resources	X		Forest Management		X
Environmental Justice		X	Fire	X	
Farm Lands (Prime or Unique)		X	Geology and Minerals	X	
Floodplains		X	Health and Safety	X	
Invasive, Non-Native Species	X		Hydrology/Water Rights		X
Migratory Birds	X		Lands/ROW/Realty Authorizations		X
Native American Religious Concerns	X		Law Enforcement	X	
Threatened or Endangered Species	X		Noise	X	
Wastes, Hazardous or Solid	X		Paleontology		X
Water Quality Drinking/Groundwater	X		Rangeland Management	X	
Wetlands/Riparian Zones		X	Recreation	X	
Wild and Scenic Rivers		X	Socioeconomic Values	X	
Wilderness		X	Soils	X	
* Dolores Public Lands Office (DPLO) resource specialists and the Responsible Official have reviewed the information in this document and concur with the findings summarized in this table and described in the following sections.			Sensitive Species	X	
			Vegetation	X	
			Visual Resources	X	
			Wildlife, Aquatic and Terrestrial	X	

Critical Elements Listing Source: Potential affects determination made by resource specialist staff and the Responsible Official for the Monument, BLM.

The project area is located within a National Monument. Primary uses of the project area are recreation, heritage tourism, grazing, and natural resource development activities consisting primarily of natural gas (including CO<sub>2</sub>) production, gathering, and transport. There are no prime or unique farmlands, known paleontological resources, wilderness or wilderness study areas, floodplains, or wild and scenic rivers within the study area. There are no people living in the study area, and no minority or low income populations that depend on the proposal; therefore, there are no potential issues associated with environmental justice.

The Proposed Action includes drilling and operation of six proposed CO<sub>2</sub> production wells, associated access roads and flow lines, and approximately 3.5 miles of production lines connecting the proposed wells into a central treatment facility. The project components located within the boundary of the Monument are the Proposed Action, and impacts to the environment are being considered based on the construction and operation of the entire project. The analysis area for land-based natural resources includes the mesa top area known as Burro Point, located generally south of Yellow Jacket Canyon and north of Rock Canyon (see Figure 2).

### **8.1 Mitigation Measures vs. Design Criteria**

Mitigation measures and design criteria are requirements that address site-specific conditions and are intended to reduce specific environmental effects. They are used to provide additional guidance for those implementing the Proposed Action. Mitigation measures were evaluated by BLM resource specialists and developed using the following criteria that should be met in identifying and designing mitigation measures:

- Reduce the environmental impacts from an action to a minor level;
- Have a demonstrated effectiveness in past use or a reasonable rationale for effectiveness if being used for the first time;
- Not be controversial in terms of effectiveness; and
- Be specific, measurable, and enforceable.

Design criteria are measures taken in the design phase of a Proposed Action to avoid or minimize a foreseeable effect to a resource. When implemented, design criteria keep the potential impact to the resource within an acceptable limit. A mitigation measure is implemented in order to reduce an impact to a resource when a design criterion has not reduced the impact to an acceptable level.

Full design criteria are detailed in the *Surface Use Plans* and *Drilling Plans* submitted by the operator with each APD packet (available from the BLM). These design criteria are standard for CO<sub>2</sub> projects and are considered binding parts of the Proposed Action that would be implemented should the APDs be approved. Where design criteria are deficient, mitigation measures are included in the COA (Appendix A). Further, mitigation measures in the COA take precedence over any design criteria in the *Surface Use Plans*.

## Cumulative Effects

For the purposes of this analysis the Area of Influence for cumulative effects analysis is the Burro Point mesa top area where the Proposed Action would be implemented. This area is chosen as the geographic Area of Influence because the majority of the direct effects of the Proposed Action would be confined to this area. The geographic boundaries for analysis would be the Monument boundary to the east, Yellow Jacket Canyon to the north, the end of Burro Point mesa to the west, and Rock Creek to the south. Direct impacts of the proposed project activities that are outside of the geographic area would be disclosed for each resource. The temporal limits for future cumulative effects analysis would be the next five years, which is the limit of the project proponent planning period. Future oil and gas and mineral development activities are estimated based on the 'Reasonable, Foreseeable Development: Oil, Natural Gas and Carbon Dioxide in Canyons of the Ancients National Monument' (BLM 2005a) prepared by the San Juan Public Lands Center – Fluid Minerals staff.

### 8.2 Critical Elements

#### 8.2.1 Air Quality

The project study area lies within the Western Slope Colorado Air Quality Control Region as defined by the Colorado Air Quality Control Commission Report to the Public 2007-2008, (CDPHE 2008). Ongoing state air quality monitoring and sources of air quality impairment in the area are summarized in the annual air quality report. Historically, the primary sources of air pollutants in this region included particulate matter from unpaved roads, seasonal sanding of paved roads for winter travel, motor vehicle emissions, and wood-burning stove emissions. Currently, air quality concerns in the Western Slope Region are from impacts of energy development and coal-fired power generation facilities, including direct emissions, support service impacts, and associated growth. In addition, controlled and uncontrolled burns are a substantial source of air pollution in this region (CDPHE 2008).

The Colorado Department of Public Health and Environment (CDPHE), Air Quality Division regulates air quality impacts from oil and gas activities and develops mitigation measures on a case-by-case basis. Impacts are evaluated to see if they are allowable or unacceptable. Air quality permits are required for emission sources on well pads if established emission thresholds for designated pollutants are exceeded.

The *Drilling Plans* for each of the proposed wells include drilling methodologies and a tested H<sub>2</sub>S Contingency Plan that is designed to alert and protect the public from accidental releases of H<sub>2</sub>S gas.

#### Environmental Consequences – Alternative 1 (No Action)

Under the No Action Alternative, there would be no short-term increase in impacts to project area (local) air quality from construction activities associated with the proposed mineral development activities within the Burro Point Area. Ongoing impacts to air quality such as traffic on area roads, impacts from coal-fired power plants, and impacts from existing compressor stations would continue.

## **Environmental Consequences – Alternative 2 (Proposed Action)**

Air emissions associated with CO<sub>2</sub> development and production activities primarily occur during well pad construction and drilling phases. Air emissions during construction activities include: hydrocarbons, carbon monoxide (CO), and nitrogen oxides (NO<sub>x</sub>) associated with production equipment; gas-fired drilling equipment; and vehicle exhaust. Other air quality impacts associated with the construction, drilling, and operation of the proposed wells and associated access roads and flow line routes would occur from several sources:

- Suspended particulates (dust) during site clearing and from vehicular traffic on unpaved roads;
- Suspended particulates (dust) from wind erosion on cleared construction areas; and
- Hydrocarbon emissions from the drill rig, service/support vehicles, and operation of gasoline and diesel engines (e.g., generators).

Air quality impacts from construction and drilling operations, primarily from vehicle/equipment exhaust and increased fugitive dust, would be low to moderate and short-term. Wind dispersion and dilution would reduce the magnitude of emissions, and these impacts would be low at locations beyond the well site boundaries.

Under normal conditions, air quality would not be affected during the production phase as a result of the operation of the wells. With the pipeline being partially aboveground, there would be the potential for pipeline rupture due to vehicle damage or rupture from firearm impacts (accidental or vandalism). If there was a break in pipeline integrity, there would be potential for release of produced gas (primarily CO<sub>2</sub>, but other compounds such as H<sub>2</sub>S would be present in low concentrations). This type of release would be short-term, as the pipeline pressures are monitored and an alarm would be triggered if there was a sudden decrease in pipeline pressure.

Indirect impacts to air quality during the production phase would occur from vehicle travel on area roads during ongoing facility and well operation inspections. The operation of the wells and pipelines are not a source of emissions of monitored parameters. No air quality permits are anticipated to be required for this alternative.

Impacts on air quality would be low to moderate and short-term during construction and drilling. The potential for releases of H<sub>2</sub>S gas would be low during the drilling phase of well development activities and is discussed Section 8.3.3 – Health and Safety. Impacts on air quality during production operations would be low and long-term.

## **Environmental Consequences – Alternative 3**

The environmental impacts associated with Alternative 3 would be the same as those described for Alternative 2. The complete burying of the pipeline would eliminate the potential for any type of human activity-caused accident (pipeline rupture due to firearm discharges or vehicle damage to the pipeline).

## Mitigation Measures

The potential impacts to air quality due to generation of fugitive dust would be mitigated by adherence to Surface Use COAs (Appendix A) should the Proposed Action be approved. Suspended dust from construction would be reduced through sprinkling of disturbed areas with fresh water from a clean water source during construction (Construction and Drilling COA #6). If the wells prove productive, the unused portions of the well pad area would be re-seeded with a BLM-approved seed mix to stabilize soils and reduce the impacts of fugitive dust created from wind erosion (Reclamation COA #2). These actions would not only reduce the amount of dust in the air but would maintain good construction site visibility, thereby minimizing potential health and safety hazards.

## Cumulative Impacts

Current sources of air quality impacts within the project area include:

- Coal-fired power plants operated in the general vicinity of the Four Corners area;
- Windblown dust from soil erosion; and
- Emissions from oil and gas and mineral development construction and operation activities, including vehicle operations.

Future sources of air quality impacts may include additional oil and gas and mineral development activities within the Monument and on adjacent public and private lands. Other sources may include existing and proposed coal-fired power plants in the general vicinity of the proposed project area. These sources of air quality impacts, in conjunction with the Proposed Action, are not anticipated to cumulatively create impacts that would cause the project area to be in non-attainment with U.S. EPA National Ambient Air Quality Standards or CDPHE standards.

### 8.2.2 Areas of Critical Environmental Concern

Areas of Critical Environmental Concern (ACEC) are those specific areas of BLM-administered lands that are managed to protect or enhance particular, special, or unique values (BLM 1985). The proposed project area is within the boundaries of the Monument, which was formerly designated as the Anasazi Culture Multiple Use Area (ACMUA) ACEC. The management objectives of the ACMUA are strengthened by the Monument designation. A description of the resources and management objectives of the Monument is presented in Section 6.0 (page 19) of this EA.

A section of the production line route would be constructed within the boundary of the Lightning Tree Tower Group. This cultural resources site/area was included in the ACMUA ACEC and was protected with No Surface Occupancy (NSO) lease stipulations in the San Juan/San Miguel Resource Management Plan Oil & Gas Leasing and Development Amendment (BLM 1991). The oil and gas lease for development of resources within the Lightning Tree Tower Group (COC 012462) was issued prior to the NSO stipulations. Therefore the NSO stipulations do not apply to the development activities proposed for the COC 012462 lease.



### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative, current land use within the Burro Point area of the ACMUA ACEC and the Monument would remain unchanged.

### **Environmental Consequences – Alternative 2 (Proposed Action)**

The Proposed Action is consistent with the terms of the lease and with the management direction outlined in the 1985 RMP, the San Juan/San Miguel Resource Management Plan Oil and Gas Leasing Amendment (BLM 1991), the BLM Interim Management Guidance for Canyons of the Ancients National Monument, and the Monument Proclamation. Implementation of the Proposed Action would require surface disturbance within the Lightning Tree Tower Group designated area within the ACMUA ACEC. The disturbance would be within an area that was previously disturbed (existing access road) and would represent a low level of impact to the resources protected by the ACEC designation. The surface impacts would not have any direct effect to the cultural resources protected by the ACEC designation, and would have low indirect effects. Additional descriptions of impacts to cultural resources are provided in Section 8.2.3 below.

### **Environmental Consequences – Alternative 3**

Environmental Consequences for ACECs associated with Alternative 3 would be the same as the consequences for Alternative 2.

### **Design Criteria**

The proposed production line route was selected to minimize activities within the 160-acre Lightning Tree Tower Group area as designated in the ACMUA ACEC Plan (BLM 1986).

#### **8.2.3 Cultural Resources and Native American Religious Concerns**

Existing cultural resources inventory data indicate that the vicinity of the project area has been utilized and inhabited by human groups from as early as 5,500 BC to present. It was intensely occupied by Ancestral Puebloan people between AD 675 and 1290. The Ancestral Puebloans were sedentary agricultural people who built settlements on the mesas and canyons of the area. Archaeologists divide the chronology of Ancestral Puebloan occupation into a series of developmental periods (Basketmaker II (AD 1-500), Basketmaker III (AD 500-750), Pueblo I (AD 750-900), Pueblo II (AD 900-1100), and Pueblo III (AD 1100-1300) that reflect changes in culture through time. Surveys suggest intensive occupation of the project area in the Basketmaker III, Pueblo II, and Pueblo III periods. During the Basketmaker III period, the Ancestral Puebloans built single and multiple pithouse settlements on the deep soils in the center of the mesa. During the Pueblo II period, the Ancestral Puebloans built single or multiple habitation units composed of masonry and adobe surface rooms and kivas also situated on the deep soils of the mesa centers. During the last century of the occupation in the Pueblo III period, the Ancestral Puebloans built large villages made of masonry situated near spring sources at the heads of canyons and away from the mesa centers.

Prior to designation as a National Monument, the entire area now known as Canyons of the Ancients National Monument was administered as the ACMUA ACEC. The ACMUA was designated on October 2, 1985, in the San Juan/San Miguel Resource Management Plan on the

basis of the collective significance and density of cultural resources. An ACEC management plan was developed to guide overall management of the ACEC with the objective of reducing impacts to significant cultural resources and their setting, as directed in the San Juan/San Miguel RMP. Significant cultural resources are defined as those that are eligible for listing on or are listed on the National Register of Historic Places (NRHP) based on the following characteristics: they are associated with events that have made a significant contribution to the broad patterns of our history; are associated with the lives of persons significant in America's past; are associated with the lives of persons significant in America's past; have yielded, or may be likely to yield, information important in prehistory or history. Subsequent site or area-specific management plans have also been developed and implemented within the ACEC prior to establishment of the Monument. The San Juan/San Miguel RMP also established No Surface Occupancy stipulations for oil and gas leasing on a number of individual sites and areas of prehistoric settlement, including the Lightning Tree Tower Group. However, these No Surface Occupancy stipulations cannot be applied retroactively to existing leases, including unitized leases held by production.

Archaeologists from Woods Canyon Archaeological Consultants (Woods Canyon) (BLM permit BLM-C-39470) conducted a series of cultural investigations in association with the project. First, a Class III archaeological survey was conducted for the original seven proposed well sites and associated access roads and pipeline alignments (Proposed Action considered in the 2008 Preliminary EA).

The proposed project area for the 2008 Preliminary EA was surveyed and reported as two separate projects, each of which is summarized below. Prior to field surveys, a records search was undertaken at the Monument and State of Colorado Office of Archaeology and Historic Preservation (OAH) to identify previously recorded sites within and in proximity to the project areas. For each well pad, a 10- to 40-acre area was inventoried by walking a series of parallel transects spaced no greater than 50 feet apart. Typically, a 10-acre area is surveyed around proposed well pads. Because of the density of cultural resource sites in the area, the survey area for well pad locations was expanded to provide more comprehensive information for project planning.

The GP #1 and GP #2 well pads and access road areas (formerly named Cannonball Mesa #1 and #2) were surveyed on May 30 and June 1, 2005. Six previously recorded archaeological sites were identified within the 10-acre survey areas. Five of the six sites are eligible for NRHP. The sixth site needs more data to evaluate eligibility to the NRHP.

The GP #3 through #7 well pads, access roads, and the proposed pipeline routes were surveyed by Woods Canyon staff between June and November 2006. Thirty-seven previously recorded archaeological sites were identified within the survey area. Twenty-seven of the sites are considered eligible for the NRHP. Five of the sites need more data to evaluate eligibility to the NRHP. Five of the sites are not considered eligible for the NRHP.

Two cultural resources reports were submitted to and reviewed by Monument staff and was reviewed by the Colorado State Historic Preservation Officer (SHPO): *A Cultural Resources Inventory of Kinder Morgan's Goodman Point Wells 1 and 2 on Burro Point* [Project No. CANM06-023]; and *A Cultural Resources Inventory of Kinder Morgan's Goodman Point Wells 3-7 and Associated Pipelines and Access Roads* [Project No. CANM07-006]).

Based on the high density of cultural sites, the proximity of the proposed well pads and pipeline routes to the sites, and public and Native American concerns, an adverse effect determination was made for the 2008 proposal (seven well locations). The SHPO concurred with the determination of adverse effect. As a result of this determination, the Monument Manager required that all uninventoried areas of Burro Point be inventoried to help determine the best well pad locations. Woods Canyon staff surveyed the remaining 642 acres of Burro Point in late July and early August of 2008. One hundred eighteen sites were located in the surveyed area, of which 23 had been previously recorded. Seventy of the sites are eligible to the NRHP; 35 are not eligible, and 13 need data. The results of the survey were compiled in *A Class III Inventory of Burro Point Mesa; A Basis for a Geographical Area Development Plan for CO<sub>2</sub> Extraction, Canyons of the Ancients National Monument, Montezuma County, Colorado* (Project No. CANM07-006B) (Honeycutt 2009). This report was submitted to and reviewed by Monument staff and was reviewed by the SHPO.

Using all cultural resource inventory data, areas of the mesa were evaluated by the BLM, the proponent, and concerned Native American tribal members for gaps between sites and existing disturbed areas that would accommodate the placement of wells, access roads, and pipelines. Planning took into consideration site density, previous disturbances, technological solutions (i.e., twinning of wells and directional drilling), and visual effects. This evaluation used maps, GIS overlays, and on the ground inspections.

As a result of this effort, Alternatives 2 and 3 were developed, with three well pad locations and a slightly realigned pipeline route. One of proposed well locations utilizes a previously disturbed area. The well locations and routes were chosen to minimize ground disturbance and to avoid significant cultural resource sites. In addition, the proposed pipeline and access ROW was narrowed from 50 feet to 25 feet to reduce surface disturbance.

The Area of Potential Effect (APE) for the Proposed Action is defined as an area that includes the well pads, roads, and pipelines with an additional 100 meter (328 feet) wide area buffer. The APE includes the area of potential direct and indirect impacts from the Proposed Action. An entire site was considered to be within the APE if a portion of the site fell within the APE.

Woods Canyon used existing archaeological data to conduct the analysis and produce the compliance report *A Cultural Resources Clearance of the Proposed Kinder Morgan Goodman Point Development Project* (Honeycutt and Fetterman 2009) for the Proposed Action. A total of 84 sites are located within the APE; 59 sites are eligible for the NRHP, 17 are not eligible, and 8 sites need additional data.

A program of subsurface testing was conducted to determine if subsurface cultural deposits existed outside the established boundaries of the sites, to facilitate NRHP evaluations, and to evaluate potential impacts from the Proposed Action. Two types of testing were conducted:

1. Using the GIS program ARCMAP 9.1, a 30 meter (100 ft) wide buffer was added to each site boundary for those sites located less than 30 meters from a construction zone. Thirty two areas were identified where this buffer intersected with construction areas. Using hand-held soil augers, auger tests spaced 2 meters apart were conducted in these areas. A

total of 2,208 hand-excavated auger holes were excavated. No cultural deposits were found in the auger tests.

2. Auger testing was also conducted within two sites, 5MT5386 and 5MT6040, where construction impacts would occur. No intact subsurface deposits were found in 5MT5386. Intact subsurface cultural deposits were found in 5MT6940. Alternative 2 was developed to minimize impacts to 5MT6940.

### **Sites Affected by the Proposed Action**

**Production Pipeline:** Four sites would be impacted. Three of these sites (5MT14932, 5MT18935, and 5MT19006) are not eligible for the NRHP and contain no subsurface cultural deposits. Site 5MT6940 is eligible for the NRHP and is cut by the existing road, with the proposed pipeline adjacent to the road. Pipeline construction on the surface through the site would eliminate surface and subsurface disturbance to the site. The pipeline would be removed if production ceases. In addition, temporary fencing and site monitoring requirements during construction would ensure site protection during implementation.

**Main Access Road:** The existing access road cuts through three sites that are eligible for the NRHP. The road would be re-routed to avoid 5MT1760 and 5MT6938. The closed portion of the road would be reclaimed without further disturbance to the sites. The road upgrade through 5MT6940 would cover the portion of the site in the road with geo-textile fabric and a 12-inch layer of gravel.

The Proposed Action is the result of comprehensive project planning and redesign (including use of new drilling technology and use of existing disturbed areas) that eliminated, reduced, or mitigated the factors contributing to the 2008 adverse effect determination. The current BLM determination of effect for the Proposed Action under Section 106 of the National Historic Preservation Act (NHPA) is no adverse effect. Project planning:

- Reduced the number of sites potentially effected by development; i.e. the number of sites located less than 30 meters (100 feet) from surface disturbance was reduced from 37 to 22 sites;
- Reduced the potential for subsurface discoveries;
- Reduced the physical footprint from 33.61 acres to 27.61 acres;
- Reduced the visual and physical disruption of the cultural landscape;
- Addressed Tribal concerns; and
- Eliminated the need for mitigation through excavation.

### **Tribal Consultation**

The Monument consults with 25 tribes (listed below) who have traditional ties to the Monument's landscape or are culturally affiliated to the Ancestral Puebloan culture group. Appendix C contains a complete summary of all tribal consultation conducted by the BLM for the 2008 and current Proposed Action.

1. Acoma, Pueblo of

2. Cochiti, Pueblo of
3. Hopi Tribe
4. Isleta, Pueblo of
5. Jemez, Pueblo of
6. Jicarilla Apache Nation
7. Laguna, Pueblo of
8. Nambe, Pueblo of
9. Navajo Nation
10. Northern Ute Tribe
11. Picuris, Pueblo of
12. Pojoaque, Pueblo of
13. San Felipe, Pueblo of
14. San Ildefonso, Pueblo of
15. San Juan, Pueblo of
16. Sandia, Pueblo of
17. Santa Ana, Pueblo of
18. Santa Clara, Pueblo of
19. Santo Domingo, Pueblo of
20. Southern Ute Indian Tribe
21. Taos, Pueblo of
22. Tesuque, Pueblo of
23. Ute Mountain Ute Tribe
24. Zia, Pueblo of
25. Zuni Pueblo

Consultation for the Proposed Action was initiated by a letter from the BLM to the Tribes dated July 2, 2007. The letter notified the Tribes about the proposal, provided the cultural inventory information and the BLM's "adverse effect" determination of effect for the undertaking, requested identification of traditional cultural properties in the project area, and requested comments regarding the proposal.

The Tribes were also mailed the quarterly Schedule of Proposed Actions (SOPA) mailings for the San Juan Public Lands, and have access to the SOPA on the Internet (<http://www.co.blm.gov/nepa/sjplcnepa.htm>). Interested tribes were asked to contact the BLM if they wanted additional information concerning the project. This project was entered into the SOPA database on December 12, 2006.

Responses were received from the Pueblo of Laguna and the Hopi Tribe. The Pueblo of Laguna stated that "The Pueblo of Laguna has determined that the proposed undertaking will not have a significant impact at this time." The Hopi Tribe's response stated that the Hopi claim cultural affiliation to the prehistoric cultural groups in the Monument, that they did not concur with the contract archaeologist's recommended determination of "no effect" to historic properties, that they recommended an "adverse effect" determination, and they requested a meeting with the BLM to discuss their opposition to the project.

An administrative meeting was held with the Hopi Tribal representatives to discuss the project design features, the archaeological resources report, and the tribal concerns with the project. In a follow-up letter from the Hopi Tribal representatives, the following issues were identified:

- Asserts the Hopi claim of cultural affiliation to prehistoric groups in the Monument, and supports the identification and avoidance of prehistoric archaeological sites and traditional cultural places.
- Cites the contradiction of potential energy development within the Monument and within BLM special area designations (Mockingbird Mesa Cultural Resource Emphasis Area and the Anasazi Cultural Multiple Use Area of Critical Environmental Concern).
- States that the Hopi do not concur with the survey report recommendation that “The building of the project will have no effect on eligible cultural resources....”
- States the concern with the small avoidance buffers between site boundaries and construction areas.
- Asserts that the Hopi conclude that the proposal “will result in significant adverse effects to numerous cultural resources significant to the Hopi Tribe.”

Follow-up efforts to contact cultural resources staff for the Pueblos of Acoma and Zia were not successful in getting responses. The Pueblo of Zia Tribal Administrator, Peter Pino, spoke to the Monument Manager, and stated that the Zia had no concerns about the project. A response dated October 15, 2007, from the Navajo Nation stated that the project will not impact any Navajo traditional cultural properties or historical properties.

Based on issues identified by the Hopi Tribe, a face-to-face consultation for the Proposed Action was conducted, including a field trip to the project area and follow-up discussions on September 3 and September 5, 2008. The following tribes were represented:

1. Acoma, Pueblo of
2. Jemez, Pueblo of
3. Laguna, Pueblo of
4. Nambe, Pueblo of
5. Santa Ana, Pueblo of
6. Zia, Pueblo of
7. Ute Mountain Ute Tribe
8. Southern Ute Tribe

Tribal questions and concerns included:

- cultural resources in the Monument are “their ancestral sites”;
- Monument offers protection and this is a plus for Pueblo people;
- need to increase buffer zones because of proximity of proposed disturbance to cultural resource sites;
- prepare treatment plans in case of discovery of human remains;
- monitor cultural resources during surface-disturbing activities and construction;
- recognize “push” for development and determine how to proceed;
- learn from tribal experiences of development on their own land;
- tribes need to find consensus among themselves; and

- help build a model to use in the future.

Tribal participants designated Peter Pino, Pueblo of Zia, and Ernest M. Vallo, Pueblo of Acoma, as tribal representatives for the group during ongoing consultation.

The following tribal recommendations were made for proceeding with project modification and impact analysis:

- based on the cultural resource inventory map, examine potential road reroute that might avoid cultural resource sites and provide better buffer zones with least surface impact;
- prevent additional study and mitigation and leave cultural resource sites intact;
- prevent excavation of human remains;
- do not reclaim routes inside site boundaries; and
- keep well pads as close to existing roads as possible.

Further consultation was conducted on December 1, 2008. Participants included tribal representatives from the Hopi Tribe, the Pueblo of Acoma, and the Pueblo of Zia; BLM representatives; Kinder Morgan representatives; and the cultural resources contractor for the project.

Woods Canyon Archaeological Consultants presented the results of auger testing completed so far in the 100-foot (30-meter) site buffer established by the Monument Manager for the project. The objective of the auger testing was to determine if subsurface deposits existed beyond the site-established boundaries and also to facilitate evaluation of NRHP eligibility.

A proposed alternate route that avoided all cultural resources, as requested by the tribes, was generated by GIS. This route was examined on the ground by BLM staff. It was subsequently dismissed as an option because of the presence of an archaeological site within the route, steep slopes, and the potential for substantial environmental impacts.

The following tribal recommendations were made for proceeding with project development and impact analysis:

- use existing road;
- limit road and pipeline ROW to 25 feet;
- lay CO<sub>2</sub> pipeline on surface in areas where subsurface cultural resources are likely to be present;
- hydromow work areas to limit ground disturbance and minimize reclamation needs;
- reroute existing road where it currently goes through two cultural resource sites;
- use existing disturbed area for two well locations;
- use horizontal drilling to minimize the number of well locations requiring new disturbance;
- require cultural resource monitor during surface-disturbing activities;
- provide revised EA to tribes for review; and
- if approved, stipulate that cut trees would be provided as firewood for Pueblo use and that a follow-up field visit be conducted after construction was completed.

The BLM proposed gating the road at the entrance to the Burro Point area to minimize vehicular access to cultural areas and to prevent further off-highway vehicle (OHV) impacts as mitigation for project development.

## **Environmental Consequences**

The direct and indirect impacts to cultural resources associated with implementation of the proposed alternatives are listed below.

### **Environmental Consequences - Alternative 1 (No Action)**

The No Action Alternative would result in no additional impacts to cultural resources within the proposed project area.

### **Environmental Consequences - Alternative 2 (Proposed Action) and Alternative 3**

1. Under Alternative 2, the access road would be upgraded and the pipeline would be constructed on the surface through a site eligible to the NRHP. These actions would not affect the significance of the site or its eligibility to the NRHP.
2. Under Alternative 2, rerouting the main road to avoid two sites would prevent further impacts associated with continued use of the road.
3. Under Alternative 3, excavation of the portion of the sites directly impacted by underground pipeline construction would mitigate the impacts, but would also result in the physical loss of a portion of a non-renewable archaeological site and the loss of cultural values to the living descendants of the Ancestral Puebloan people.
4. Under Alternative 2 or Alternative 3, project construction and operations would result in the relatively long-term (+ or – 50 years) alteration, including vegetation removal and physical alteration of the terrain, and fragmentation of the physical setting of the cultural resources in the Goodman Point area.
5. Under Alternative 2 or Alternative 3, indirect effects to cultural resources would include increased potential for vandalism and increased potential for erosion.

## **Mitigation Measures**

### **Mitigation Measures - Alternative 1**

None required.

### **Mitigation Measures - Alternative 2 (Proposed Action)**

A detailed description of all mitigation measures is included in the Surface Use Conditions of Approval (Appendix A).

### **General Cultural Resource Protection Conditions of Approval:**

1. Before beginning work, it is the responsibility of the operator to inform all employees, contractors, and subcontractors of applicable cultural resource laws and regulations; as well as the project-specific measures for protecting cultural resources. Disturbance to, defacement of, or collection or removal of archaeological, historical, or sacred material is prohibited by law. Disclosure or release of information regarding the nature and location of



archaeological, historic, or sacred sites, without written approval by the Bureau of Land Management (BLM) is prohibited by law.

2. Disclosure or release of information regarding the nature and location of archaeological, historic, or sacred sites, without written approval by the BLM, is prohibited under provisions of the Archaeological Resources Protection Act. Cultural resource and other permittees of the BLM are allowed to use this information during the course of the project for site protection purposes only. Unauthorized use or distribution of this information (which includes site location information present in cultural resource reports) is a violation of Federal statute.
3. If cultural resources or human remains, funerary items, sacred objects, or objects of cultural patrimony are discovered during construction, activity in the vicinity of the resource will cease, the resource will be protected, and the Canyons of the Ancients National Monument Archaeologist at 970-882-5614, will be notified immediately and the following procedures will be carried out. Should cultural resources be discovered during construction, activity in the vicinity of the resource will cease, the resource will be protected, and the Monument Archaeologist at 970-882-5614, will be notified immediately. The operator shall take any measures requested by the BLM to protect the resources until they can be evaluated and treated. The discovered resources will be documented and evaluated by a permitted archaeologist. The permitted archaeologist, in consultation with the BLM archaeologist, will make a determination of the nature and significance of the discovery, and will determine the appropriate method of treatment for it. Avoidance is the preferable treatment. However, if the resources cannot be avoided, the appropriate treatment method will be determined, and the permitted archaeologist will prepare any and all necessary treatment plans. These plans will be reviewed and approved by the BLM. Treatment activities will be conducted after all necessary consultations have been completed as required by Section 106 of the National Historic Preservation Act, the Native American Graves Protection and Repatriation Act, and the Archaeological Resources Protection Act. The BLM will be responsible for conducting all necessary consultations. Construction within the area of the discovery will be allowed to proceed after the appropriate treatment has been completed.
4. Pursuant to 43 CFR 10.4, the holder of this authorization must notify the Monument Archaeologist at 970-882-5614, by telephone, with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. The operator must stop activities in the vicinity of the discovery and protect it until notified to proceed by the authorized BLM officer.

#### **Cultural Resource Protection and Monitoring Conditions of Approval:**

5. Temporary fences will be erected, either by or under the direction of a permitted archaeologist, adjacent to the cultural resource sites specified in Table 6-2 of *A Cultural Resources Clearance of the Proposed Kinder Morgan Goodman Point Development Project* (Honeycutt and Fetterman 2009:13) prior to the start of construction activities.
6. Sites determined “eligible” or “need data” located 10 meters (30 feet) or less from construction would have temporary barrier fences erected at the edge of the authorized

construction area nearest to the site boundary. Site monitoring would be completed a minimum of three times during implementation: 1) during initial ground disturbance, 2) periodically during active work, and 3) a final check after construction is completed. Monitoring results will be submitted in writing upon completion of each phase (initial, periodic, and final).

7. Sites determined as “not eligible” for the NRHP located 10 meters or less from construction would be monitored once during initial ground disturbance. Monitoring results will be submitted in writing upon completion of each phase (initial, periodic, and final).
8. Cultural resource monitors would assure that construction activities are confined within fenced and flagged areas. No equipment or construction would be allowed beyond the fence anytime during construction or subsequent well operations.
9. All soil removal operations and trenching for the well pads, pipelines, and building of access roads would be monitored by a permitted archaeologist for subsurface cultural resources.
10. For construction of the proposed pipeline and main access road through site 5MT6940: Vegetation would be cleared by hand for the pipeline ROW. The existing road and the pipeline ROW, located 5 feet east of the existing road, would be covered with geo-textile fabric to protect cultural deposits below the existing road and in the pipeline ROW. A 12-inch thick bed of gravel would be placed on top of the fabric. All pipeline construction would occur above the geo-textile fabric and gravel. The pipeline would be placed on concrete thrust blocks and suspended aboveground. To protect the site, periodic inspection of the thrust blocks would be conducted to insure that the blocks remain on top of the gravel.
11. All work, staging, and parking of equipment will be confined to the approved areas specified in the EA.
12. The access road at the entrance to the Burro Point project area will be gated and locked to minimize vehicular access to cultural areas and to prevent further OHV impacts and vandalism.

**To minimize visual impacts to the cultural landscape:**

13. Portions of the well pads deemed unnecessary for production shall be shaped to conform to the natural terrain. Topsoil stockpiled during construction should be spread back over the recontoured areas. Portions of the access roads and pipeline routes deemed unnecessary for production should also be reseeded. Native vegetation would be re-established throughout the disturbed area, leaving only a small teardrop for access to the wellhead during operations (see Reclamation COAs).
14. Upon termination of all operations, native vegetation would be re-established in all remaining disturbance (see Reclamation COAs).

15. Vegetation removal would be designed to maximize screening of disturbed areas viewed from cultural resource sites to the development and from the development to cultural resource sites. Use of irregular vegetation removal patterns would help retain a natural appearance (see Construction COAs).

**To address Tribal Recommendations:**

As stated in the EA:

16. The existing road will be upgraded to accommodate development activities.
17. The road and pipeline ROW will be limited to 25 feet.
18. The CO<sub>2</sub> pipeline will be laid on the surface in areas where subsurface cultural resources are likely to be present.
19. Work areas will be hydromowed [instead of bladed] to limit ground disturbance and minimize reclamation needs.
20. 1,100' of the existing main access road that cuts through two sites would be re-routed to avoid the sites. The abandoned road section would be reclaimed using non-disturbing techniques, such as spreading brush on the surface and hand seeding.
21. The existing disturbed area will be used for two well locations (GP 22 and GP 23).
22. Horizontal drilling will be used to minimize the number of well locations requiring new disturbance.
23. Cultural resource monitors will be present during surface-disturbing activities.
24. Cut trees will be provided as firewood for Pueblo use.
25. A post-construction field visit will be conducted with tribal representatives.

**Mitigation Measures - Alternative 3**

The entire proposed pipeline would be constructed below ground and mitigation would be the same as for Alternative 2 above, except the pipeline would split from the road and be routed around a site to avoid direct impacts, requiring an additional 817.2 feet of new construction and an additional 0.47 acres of disturbance.

**Mitigation Measures to Address Indirect Effects associated with Alternatives 2 and 3**

1. A locked gate would be installed at the turn-off from the county road to prevent motorized access by the general public. The gate would diminish the potential for increased vandalism.
2. Site monitoring would be conducted by BLM Rangers, Cultural Site Stewards, and Kinder Morgan employees.
3. Immediate post-construction vegetative reclamation would be completed to prevent erosion of cultural resources. Excelsior wattles and matting would be installed if needed.

## Cumulative Effects

Cumulative effects on cultural resources are associated with past actions, the Proposed Action, and foreseeable future actions. In the past, cultural resources have been affected by both natural agents (erosion, bioturbation [soil disturbance by burrowing or boring animals], and wildfires) and cultural agents (chaining, livestock grazing, recreation, vandalism, cultural resource investigations, and oil and gas development). For the purposes of the following discussion, the term study area refers to the land within a 1-mile radius of the proposed project area. The exception to this occurs in the discussion of oil and gas development, in which study area includes the entire Monument.

Erosion, bioturbation, and wildfires have had impacts on cultural resource sites in the past. Data on the impact of these natural agents is limited and relies entirely on notes gathered during site recordation. For the 84 sites located in the APE, erosion was noted to have impacted five sites, bioturbation impacted one site, and wildfire impacted two sites. Based on the data for the project and for data gathered during a recent cultural resource survey (Hovezak et al. 2002), it appears that these impacts have not been severe. In the foreseeable future, the dense vegetative growth in the study area makes sites susceptible to the effects of wildfires, like the Goodman Fire that burned in the summer of 2006.

Chaining for past vegetation management purposes was conducted over the entire proposed project area in the early 1960s. Impacts noted to sites within the proposed project area include displaced and scattered surface artifacts; however, surface features and subsurface site deposits retain integrity, to varying degrees.

Livestock grazing has occurred in this area of Southwest Colorado area since the late 1870s (Horn 2004). Approximately 40% of the sites located or relocated during the 2002 cultural resources survey of the Burro Point area (Hovezak et al. 2002) were noted to have livestock impacts; most of the impacts were limited to trampling of the surface, and were minor in nature. One site, located near a water source had a heavy amount of disturbance, due to livestock concentrating around the water source.

Impacts to sites from vandalism were noted at five sites. At three sites there is evidence of surface artifact collection and at two sites there is evidence of illegal excavation. This vandalism has affected both the scientific and heritage tourism values of the sites to varying degrees. A study of illegal vandalism in the 1970s noted that sites located near roads have a higher frequency of looting (Nickens et al. 1981). Since the passage of the Archaeological Resources Protection Act of 1979 and an increased focus on public education about protection and stewardship of archaeological resources, vandalism of sites near roads by the general public appears to have decreased slightly. Another contributing factor may be increased public use of roads which possibly serves as a deterrent to illegal activities at sites located near roads.

One site in the study area has been excavated for scientific research (Kent 1991). This investigation had both negative and beneficial effects on cultural resource values. The negative effect is the destruction of tangible and intangible aspects of the sites. The beneficial effect is the scientific knowledge gained about the site.

Oil and gas development has occurred in the study area since 1911, and Carbon Dioxide development began in the 1970s. Between 1911 and 1970 this work was conducted without consideration of cultural resource values and, as a result, an unknown number of cultural resource sites may have been impacted by development during that time period. The National Historic Preservation Act was passed in 1966 and requires Federal agencies to consider the effects of undertakings upon historic properties. Compliance with the NHPA has minimized impacts to cultural resources by oil and gas development.

The cumulative effects analysis of oil, natural gas, and carbon dioxide development on cultural resources was completed using the following methodology.

Cultural resource information relating to past development forms the basis of this analysis. A literature/geographical information system (GIS) search of inventory and archaeological information was conducted using records from the Colorado Office of Archaeology and Historic Preservation Office and the BLM Canyons of the Ancients National Monument. Information was also compiled for the proposed action, future development, and cumulative development using the following methods.

## **PAST DEVELOPMENT**

Data were obtained for the following categories:

- Total Oil, Gas, and Carbon Dioxide development projects (includes wells, seismic, roads, power lines, and facilities)
- Number of acres surveyed (archaeological inventory)
- Number of sites located (by the archaeological inventory)
- Number of sites affected (sites that were tested and/or excavated for Section 106 purposes)
- Number of sites discovered (sites not located by the archaeological inventory and found during project implementation).

While data files were queried specifically for Monument projects, the resulting numbers are approximate. This is due to several factors: Projects extend outside of the Monument, some of the areas have been inventoried multiple times, and some sites have been relocated multiple times. The figures are not adjusted to account for these factors.

## **PROPOSED ACTION**

The same categories of data were compiled for the proposed action (this project).

- For “sites affected,” three sites are not eligible for the NRHP and one site is eligible for the NRHP. The qualities of significance for the NRHP of the site are not adversely affected by the proposed action because of project design.
- The “projected number of sites discovered” is estimated to be zero as a result of the testing conducted during project planning.

## FUTURE DEVELOPMENT

Two projections were evaluated. The first is based on data from past projects, and the second is based on data from the proposed action. The projected data for the following categories were based on the following analyses:

- “Projected number of projects” and “Projected acres of disturbance” is based on data in the “Reasonable, Foreseeable Development: Oil, Natural Gas, and Carbon Dioxide Development in Canyons of the Ancients National Monument” (BLM 2005a). This document provides a forecast of development in the Monument for the period 2005 to 2025.
- “Projected number of acres surveyed” (archaeological inventory) is assumed to be equal to the acres of disturbance and that Class III (100%) archaeological inventories will be completed for all future projects.
- “Projected number of sites located” is based on the inventory data for the proposed action, which resulted in a site frequency of 1 site per 4 acres. (The APE contains 342 acres divided by 84 sites located = 1 site/4 acres). The “projected acres of disturbance/number of acres surveyed” was divided by 4 to obtain the “projected number of sites located.”
- “Projected number of sites affected” based on the past was calculated by “past sites affected” divided by “past total sites located” multiplied by the “projected number of sites located.”
- “Projected number of sites affected” based on the proposed action was calculated by “proposed action number of sites affected” divided by “proposed action number of sites located” multiplied by the “projected number of sites located.”
- “Projected number of sites discovered” based upon the past was calculated by “past sites discovered” divided by “past total sites located” multiplied by the “projected number of sites located.”
- “Projected number of sites discovered” based on the proposed action was calculated by “proposed action anticipated number of sites discovered” (i.e. 0) divided by “proposed action number of sites located” multiplied by the “projected number of sites located.”

For future oil and gas development it is projected that 496 sites will be located by Class III inventories.

- Based on projections from past projects, 17 sites will be affected and 4 new sites will be discovered during implementation.
- Based on projections from the proposed action, 3 sites will be affected and no sites would be discovered during implementation. The reduction in sites affected and discovered is attributed to the more comprehensive planning process used for the proposed action, in contrast with the limited focus of development planning in the past.

## CUMULATIVE DEVELOPMENT

Cumulative development represents the sum of the data for past, proposed action, and future development. Two scenarios were evaluated for cumulative development. The first is based on projections of past projects, and the second is based on projections of the proposed action (see Table 5).

For cumulative oil and gas development it is projected that 2,711 sites will be located by Class III inventories.

- Based on the projection from past projects, 49 sites will be affected and 26 sites will be discovered during implementation; 22 of the discovered sites are attributed to past development, and 4 new sites are projected to be discovered.
- Based on the projection from the proposed action, 35 sites will be affected and 22 sites will be discovered. However, no new sites would be discovered during implementation. Again, the reduction in sites affected and discovered is attributed to the more comprehensive planning process used for the proposed action, in contrast with the limited focus of development planning in the past.

Archaeological knowledge of the region has been enhanced as a result of information collected through inventories and data gathering associated with past oil and gas development. These investigations have contributed to recent regional research projects. However, the nature of narrow project-specific inventories and investigations may somewhat limit the utility for the integration of collected data into the broader archaeological context.

**Table 5. Past, Proposed Action, Projected Future, and Cumulative Cultural Resource Information for Oil, Gas, and Carbon Dioxide Development Projects in Canyons of the Ancients National Monument.**

	<b>Number of Projects</b>	<b>Number of Acres Surveyed</b>	<b>Number of Sites Located</b>	<b>Number of Sites Affected</b>	<b>Number of Sites Discovered</b>
<b>Past</b>	261	26076	2124	28	22
<b>Proposed Action</b>	5	342	84	4	0
	<b>Projected Number of Projects</b>	<b>Projected Acres of Disturbance/ Number of Acres Surveyed</b>	<b>Projected Number of Sites Located</b>	<b>Projected Number of Sites Affected</b>	<b>Projected Number of Sites Discovered</b>
<b>Future – Projected based on Past</b>	249	1985	496	17	4
<b>Future – Projected based on Proposed Action</b>	249	1985	496	3	0
<b>Cumulative – Projected based on Past</b>	503	28403	2711	49	26
<b>Cumulative – Projected based on Proposed Action</b>	503	28403	2711	35	22

## 8.2.4 Invasive, Non-Native Species

The interim management guidelines for BLM National Monuments state that “existing noxious weed control activities should continue. Exotic species should not be introduced” (BLM 2001a). The Colorado Noxious Weed Act prioritizes noxious weed management into three groups (lists): List A-species designated for eradication; List B-species for which noxious weed management plans are designed to stop their continued spread; and List C-species for which management plans are not designed to eradicate or to stop their continued spread, but to provide additional education and research.

Field visits were conducted for the original 2008 EA on October 24, 2006, December 5, 2006, and March 7, 2007. Additionally, a site visit for the three well pad locations being considered under Alternative 2 was made on November 14, 2008, and January 20, 2009. No List A noxious weeds were identified during any field visits. However, one List C (cheatgrass) and one List B (filaree) noxious weed species were identified during the field surveys. Cheatgrass (*Bromus tectorum*), an invasive, non-native annual grass, was observed throughout the project area, and filaree (*Erodium cicutarium*), a common invasive annual forb occurring on disturbed soils, was identified near existing roadways. Because the field surveys occurred at the end of the normal growing season (and outside the flowering period) for most plants, it is possible that additional noxious weeds occur in the project area.

### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative, there would be no potential for the introduction or spread of weeds above the risk from existing land uses including road maintenance, ongoing oil and gas development, and recreational vehicle use of the area. Existing land uses would provide a seed source for weeds, and small amounts of disturbance could allow weeds to become established. Existing noxious weed populations in the Monument would provide sources of seeds for further noxious weed establishment. Ongoing noxious weed management activities (e.g., oil and gas operators spraying weeds according to Pesticide Use Plans) would also continue.

### **Environmental Consequences – Alternative 2 (Proposed Action) and Alternative 3**

The following impacts are expected for both Alternative 2 and Alternative 3 since both Alternatives include three well pads and access roads being constructed. Ground-disturbing activities (well pad, access road, and production line route clearing) increase the chances of noxious weed infestation. Because cheatgrass and filaree are already present in some portions of the project area, it is likely that some disturbed sites may be invaded by these species following construction or during reclamation efforts. Increased vehicle traffic could increase the potential for noxious weed infestation in the project area from seed transport on vehicles. These impacts would be low to moderate and short-term if weeds are controlled following construction. If they are not controlled, both Alternatives could result in a noticeable change in the composition of the project area vegetation. As unused areas of the well pads are reclaimed, impacts would shift to low and long-term. Alternative 3 would have a slight increase in the acreage of ground disturbance over Alternative 2. Therefore, the chance of introduction and spread of weeds would be slightly higher than Alternative 2.



## Design Criteria

The following design criteria would minimize and/or avoid the introduction or spread of noxious weeds. Stripped topsoil and vegetation from construction would be stockpiled for subsequent reclamation of unused areas of the well pads, providing a source of native plant seeds. As part of Storm Water Management Plan inspection activities and routine operation inspections, reclaimed areas of the well pads and production line routes would be inspected for invasive and noxious weeds. If areas of weed infestation were observed, appropriate control of the outbreaks would be implemented.

## Mitigation Measures

The following mitigation measures are included in the project COAs (Appendix A). Cleaning of all vehicles and heavy machinery to remove seed and soil would be completed prior to construction activities to reduce the potential of introducing invasive species into the project area. During the operations phase of the project, reclaimed areas would be monitored by Kinder Morgan field staff for noxious weeds. All noxious and invasive species that occur onsite would be controlled using materials and methods approved in advance by the BLM. As part of interim and final reclamation activities, re-vegetation with a BLM-approved native seed mix (see Table 6) would be initiated by Kinder Morgan following completion of construction and drilling activities, and on disturbed areas not required for production operations. Kinder Morgan would notify the BLM prior to initiating seeding activities on well pads and production line routes.

**Table 6. BLM-approved seed mix for project reclamation.**

Kinder Morgan Burro Point Seed Mix			Drilled Rate		Broadcast Rate	
Common Name	Species Name	Variety	Pounds/acre	Pure live seed/ ft <sup>2</sup>	Pounds/acre	Pure live seed/ ft <sup>2</sup>
Indian ricegrass	<i>Achnatherum hymenoides</i>	Rimrock	6.2	20	11.7	38
Squirrel tail	<i>Elymus elymoides</i>	Bottlebrush	1.1	5	2.2	10
Blue grama	<i>Chondrosom gracile</i>	Alma	0.3	5	0.5	10
Mutton grass	<i>Poa fendleriana</i>	VNS	0.4	10	0.8	19
Needle and Thread	<i>Hesperostipa comata</i>	VNS	1.9	5	3.6	10
Galleta	<i>Hilaria jamesii</i>	Viva, florets	1.4	5	2.6	10
		<b>Total</b>	<b>11.3</b>	<b>50</b>	<b>21.4</b>	<b>95</b>

Key: ft<sup>2</sup> = square fee; VNS = variety not stated.

## Cumulative Impacts

Past, present, and reasonably foreseeable future actions that impact weeds would include past chaining of the project area, past access road construction, past drilling of the well at the twinned GP #22 and 23 location, grazing, recreational use, and future oil and gas development. Past surface disturbance introduced at least two Colorado-listed weeds found in the project area, while all surface-disturbing activities in the Monument provide potential for direct weed introduction and spreading. Past and current weed management activities help to slow the spread of weeds, and future projects would be required to also monitor and manage weeds. For this project, weed impacts would be confined to the area of disturbance (27.6 acres in Alternative 2, 28.1 acres in Alternative 3). Monitoring and treatment described above would further reduce the

spread of noxious weeds. Overall, the proposed project activities would have a low contribution to the extent of noxious weeds present within the project area.

### **8.2.5 Migratory Birds**

The proposed project area occurs in piñon-juniper woodland, a vegetative community supporting the most diverse avian populations of upland communities in the western U.S. (Colorado Partners in Flight [CPIF] 2000). Consequently, the project area supports a large suite of migratory and resident bird species that are protected under the Migratory Bird Treaty Act (MBTA). Bird species that breed in piñon-juniper habitats include gray flycatcher (*Empidonax wrightii*), black-throated gray warbler (*Dendroica nigrescens*), bushtit (*Psaltriparus minimus*), white-breasted nuthatch (*Sitta carolinensis*), pinyon jay (*Gymnorhinus cyanocephalus*), plumbeous vireo (*Vireo plumbeus*), and blue-gray gnatcatcher (*Poliophtila caerulea*).

The U.S. Fish and Wildlife Service (USFWS) maintains a Birds of Conservation Concern (BCC) list (2002). These are non-game migratory avian species that the USFWS has targeted as conservation priorities but are not currently federally listed as threatened or endangered. BCC species with potential to occur in the project area are golden eagle (*Aquila chrysaetos*), gray vireo (*Vireo vicinior*), juniper titmouse (*Baeolophus ridgwayi*), and pinyon jay. Both juniper titmouse and pinyon jay were observed during field surveys. Additional common migratory species observed during field surveys include American crow (*Corvus brachyrhynchos*), American kestrel (*Falco sparverius*), American robin (*Turdus migratorius*), black-billed magpie (*Pica hudsonica*), bushtit, common raven (*Corvus corax*), dark-eyed junco (*Junco hyemalis*), mountain chickadee (*Poecile gambeli*), pine siskin (*Carduelis pinus*), and red-tailed hawk (*Buteo jamaicensis*). Birds occurring in piñon-juniper woodlands nest in trees or shrubs from mid-April to early August.

#### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative, there would be no impacts to project area migratory birds.

#### **Environmental Consequences – Alternative 2 (Proposed Action) and Alternative 3**

Under Alternatives 2 and 3, the project would result in a maximum disturbance of 27.6 acres of vegetation for Alternative 2 and 28.1 acres for Alternative 3 during construction and 19.4 acres of vegetation long-term. Vegetation removal would result in a direct loss of breeding and foraging habitat for avian species associated with piñon-juniper woodlands. The permanent loss of vegetation would be a low, long-term impact based on the presence of surrounding undisturbed habitat in the area. Construction activities could directly impact area birds, including species occupying cliff habitat adjacent to the project area, due to increased noise and human activity. However, cliff habitat adjacent to twinned wells GP #22 and 23 was assessed, and it did not appear to be suitable for raptors (Paul Morey, pers. comm). Depending on the timing of the project, active nests could be destroyed during vegetation clearing between April and August; however, mitigation measures listed below would minimize the direct loss of active nests. The reserve pits, if uncovered, pose a hazard to birds flying into or drinking from them. Mitigation measures below would prevent this impact. Impacts to migratory birds are expected to be low (based on the small acreage affected) and short-term. The duration of construction activities for

each well pad would be for a period of several weeks, thereby limiting the severity of potential impacts to a short time period for any specific area.

There would be long-term indirect impacts to area birds during operation of the wells from periodic human activity, vehicular traffic in the area, and from the conversion of habitat to industrial use. Well operation would not require onsite pump jacks or compressors; therefore, post-construction noise impacts are expected to be low. Because much of the project occurs in undisturbed terrain, the resulting increase in habitat edge might cause an increase in nest predation and cowbird parasitism in adjacent areas (Paton 1994). These impacts are expected to be low and long-term. BCC species with potential to occur in the project area are expected to disperse into available undeveloped piñon-juniper habitat surrounding the project area. No population level impacts to these species are expected.

Under Alternative 2, potential impacts to area birds would be low to moderate and short-term during construction and drilling, and low and long-term during operation. These potential impacts would be minimized by the implementation of mitigation measures described below. While there may be some impacts to individual birds, impacts to regional populations of these avian species are expected to be low.

### **Mitigation Measures**

The impact to migratory birds caused by the removal of vegetation would be mitigated through the implementation of reclamation measures and best management practices outlined in the Surface Use COAs (Appendix A). The COAs include the following measures that would help in mitigating impacts to birds. After drilling of the wells is complete and the reserve pits have been fenced, bird netting would be placed over the pits. Construction activities would be confined to the proposed well pads, access roads, and production line corridor areas to minimize disruption to area birds. If vegetation removal must take place during the breeding season (April to August), an inventory of the area to be cleared would be performed to identify any active nests. If active nests were found, vegetation removal would be postponed until after the nest either successfully fledges young or fails.

### **Cumulative Impacts**

Most disturbances to migratory bird habitat in the project area have occurred in the past 4 decades: chaining occurred in the 1970's, the access road was built in 1978, and the old plugged and abandoned well (Woods #6) at twinned wells GP #22 and 23 was shut-in in the 1980s and the site was reclaimed. Past grazing impacted the woodland understory more than the trees and likely indirectly impacted ground foraging birds by changing the vegetation structure. Impacts to migratory birds from grazing are expected to continue in the future, though it is difficult to quantify the level. No other new oil, gas, or CO<sub>2</sub> wells are projected for the Burro Point Mesa within the next 5 years. Due to the low habitat loss for shrub- and tree-nesting birds from this project combined with past losses of habitat, the project's contribution to cumulative impacts would be low.

## 8.2.6 Threatened and Endangered Species

In accordance with the Endangered Species Act (ESA) of 1973, as amended, a list of threatened, endangered, or candidate flora and fauna species with potential to occur in Montezuma County and/or in the project area was reviewed (USFWS 2008). The project area was assessed for potential habitat of listed species on November 14, 2008, by biologists from Ecosphere and December 17, 2008, by BLM biologist Paul Morey.

Potential habitat for the federally threatened Mexican spotted owl (*Strix occidentalis lucida*) was modeled using GIS in the project area in June 2008 by the BLM Dolores Office. BLM biologist Paul Morey conducted a site assessment on December 17, 2008, to ground truth the mapping and evaluate the potential for owls to nest within or adjacent to the project area. He concluded that the rocky cliffs are too small (less than 20 feet high) and there is inadequate cover for owls and their primary prey species, woodrat (*Neotoma sp.*), within 0.5 mile of the project area; therefore, no protocol surveys would be needed since owls do not have potential to occur within the project area (Paul Morey, pers. comm.).

None of the other current federally listed threatened, endangered, or candidate species in Montezuma County have potential to occur in the project area (see Appendix B for list of species).

The Standard for Public Lands Health for threatened and endangered species is not applicable to the proposed project as no threatened or endangered species or their associated habitat are present in the project area or vicinity.

### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative there would be no impacts to listed species.

### **Environmental Consequences – Alternative 2 (Proposed Action) and Alternative 3**

Under Alternatives 2 and 3, there would be no direct, indirect, or cumulative impacts to federally listed threatened, endangered, or candidate species because there are no species with potential to occur within the project area or project area vicinity.

### **Mitigation Measures**

Construction activities would be confined to the proposed well pads, access roads, and production line routes to avoid potential impacts to any listed species if they were to occur in the vicinity of the project. Kinder Morgan would contact BLM resource specialists immediately if any listed species were identified during construction or operation of the proposed projects.

### **Cumulative Impacts**

As noted above, there are no species with potential to occur within the project area or project vicinity; therefore, the Proposed Action would not contribute towards cumulative impacts to federally listed threatened, endangered, or candidate species.

### **8.2.7 Hazardous or Solid Wastes**

The proposed project area and general vicinity do not contain any known hazardous waste or solid waste disposal areas. Hazardous materials subject to regulation that may be found at each well drilling site during drilling and completion activities may include: drilling mud and cementing products that are primarily inhalation hazards; fuels (flammable and/or combustible); and materials that may be necessary for well completion/stimulation activities such as flammable or combustible substances, fly ash, and acids/gels (corrosives). Human solid and liquid wastes would be generated primarily during the construction and drilling phases of the project and would be contained within portable facilities at the site. Solid waste generated during drilling and operation activities would be disposed of offsite in a regularly maintained solid waste disposal container.

Kinder Morgan maintains a file, per 29 CFR 1910.1200(g), containing current Material Safety Data Sheets (MSDS) for all chemicals, compounds, and/or substances utilized during the course of construction, drilling, completion and production operations for each of the proposed wells.

#### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative, there would be no increase in potential exposure to hazardous or solid wastes in the Burro Point area.

#### **Environmental Consequences – Alternative 2 (Proposed Action) and Alternative 3**

Under Alternative 2 and 3, there would be potential for spills of fluid hydrocarbons or other chemicals used during the drilling and completion activities. Human solid and liquid wastes would be generated primarily during the construction and drilling phases of the project activities and would be contained within portable facilities at the site. The potential for environmental impacts from spills or releases of regulated substances in excess of Federal and State reportable quantities would be low due to the volume of material handled, the design criteria that would be used to reduce potential impacts, and the cleanup procedures that would be used. The Surface Use Plans for the proposed construction and drilling activities include measures for responding to spills at the well sites. The potential for release of hazardous or solid wastes is low to moderate and short-term during construction and drilling and low and long-term during production operations.

#### **Mitigation Measures**

The following proponent-committed measures address potential impacts to human health and the environment due to use of hazardous materials during implementation of the proposed project. After completion of drilling activities, all solid waste present within a given work area would be collected and disposed of in a permitted facility. Onsite solid waste disposal facilities would also be periodically emptied during drilling activities. Any spills or releases of drilling or fracing fluids would be cleaned up and disposed in accordance with State and Federal regulations.

## Cumulative Impacts

The proposed project area and general vicinity are not a source of large volumes of solid waste for area solid waste disposal facilities. The amount of solid waste generated from the Proposed Action would not cause any existing permitted solid waste disposal facilities to exceed their operating capacities. Any small volumes of hazardous waste generated from construction and well drilling activities would not cause any permitted facilities to exceed their capacities.

### 8.2.8 Surface Water and Groundwater

The proposed project area is situated on a mesa top that drains to the north into Yellow Jacket Canyon and to the south into Burro Canyon. Yellow Jacket Canyon is located approximately 1 mile to the north of the proposed pipeline route and the proposed well pad locations. No perennial water sources are located within a 1-mile radius of the proposed project area.

#### *Surface Water*

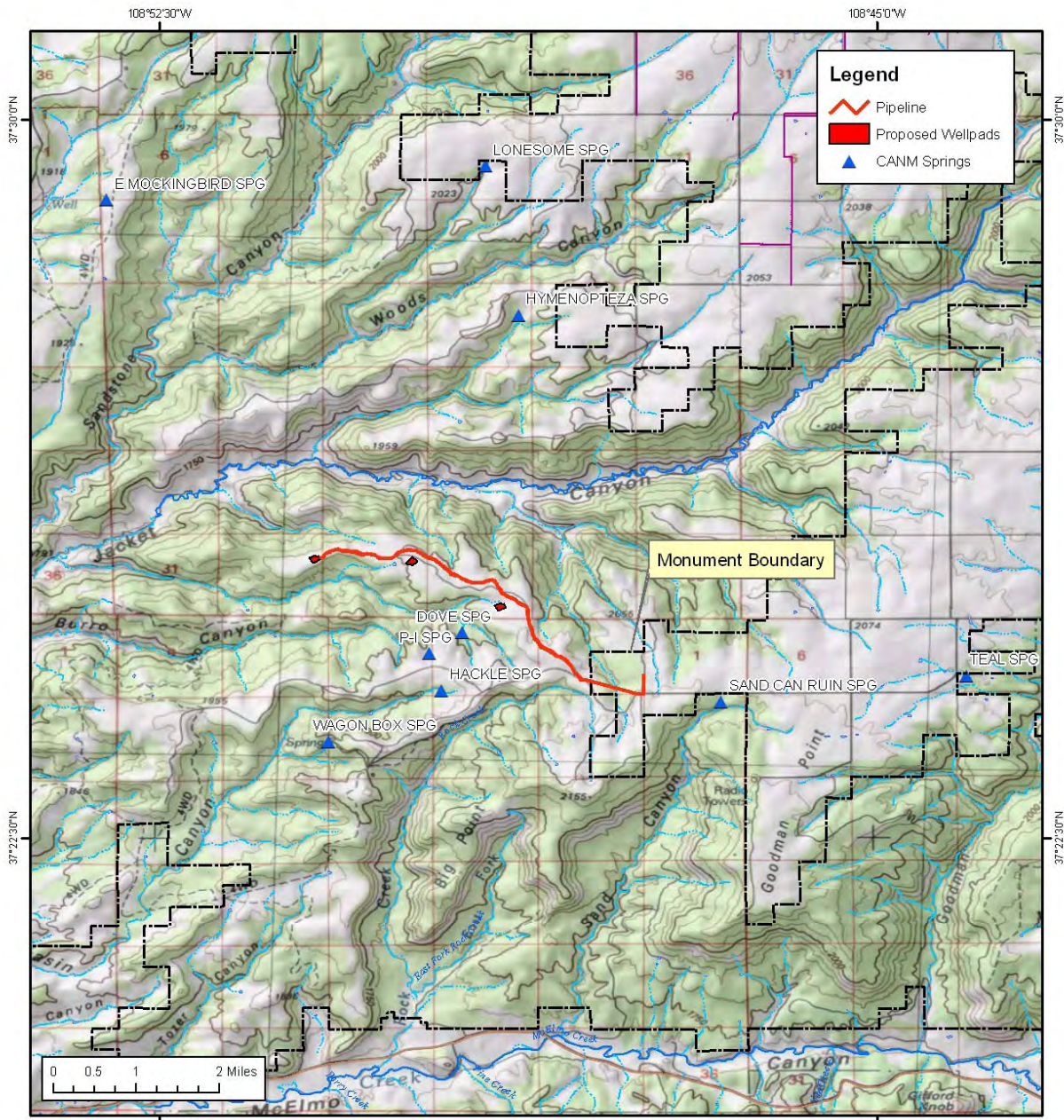
Sand Canyon is an ephemeral tributary to McElmo Creek and eventually the San Juan River, which runs generally east to west approximately 24 miles south of the project area. McElmo Creek, a perennial waterway, is located approximately 5 miles south of the proposed project area. Yellow Jacket Creek has perennial flows and is located approximately 1 mile to the north of the proposed project area. Typically, the San Juan River experiences peak flows, primarily from snowmelt, between April and June (BLM 1985). Principal water uses within the San Juan River Basin include irrigation, municipal, industrial, domestic, recreational, and transmountain and transbasin diversion uses.


No riparian habitats or riparian vegetation species were observed immediately adjacent to or within a 0.5-mile radius of the proposed well pads or flow line route locations. Various unnamed ephemeral drainages are located throughout the project area. The hydrologic regime in the vicinity of the project area is such that surface water flows only on an intermittent basis in conjunction with sizable precipitation events. Thunderstorms are the primary source of intermittent flow in these ephemeral drainages, which are also fed by snowmelt. Key factors that influence the surface water quality in the project area include sparse vegetative cover, highly erosive soils, rapid runoff, and livestock grazing. Surface runoff from each of the well pad locations discharges to local ephemeral tributaries that eventually discharge to McElmo Canyon.

There is one identified spring (Dove Spring) located in the general vicinity (within 0.5 mile) of the proposed project development components. The spring is located within the Burro Canyon drainage, to the southwest of the proposed GP #20 and #21 well pad. The location of this and other mapped springs relative to the project components are shown on Figure 4.

Total suspended solids, total dissolved solids (salinity), and heavy metal and biogenic pathogens are the water quality parameters of concern (BLM 1985) within the project area. McElmo Creek is not listed in the CDPHE 2006 Clean Water Act Section 303(d) list of impaired waters within the State of Colorado. The project area is considered to be meeting Public Lands Health Criteria for water quality (surface and ground water).





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	GOODMAN POINT DEVELOPMENT PROJECT	
	FIGURE 4	AREA SPRINGS
	TOWNSHIP 37N RANGE 18W, SECTIONS 32, 33 & 34	MONTEZUMA COUNTY, CO
	TOWNSHIP 36N RANGE 18W, SECTIONS 2 & 3	5/1/09

**Figure 4. Surface Water Resources – Area Springs**

## ***Groundwater***

The groundwater aquifer in the project area consists of the Colorado Plateau Aquifers that underlie an area of approximately 110,000 square miles in western Colorado, northwestern New Mexico, northeast Arizona, and eastern Utah. Aquifers within the Colorado Plateau are generally composed of permeable sedimentary rocks that vary in thickness, lithology, and hydraulic characteristics. Within the project area, the Mesa Verde and Dakota-Glen Canyon aquifers are the uppermost water-yielding units in the Colorado Plateau aquifers. Water from the Mesa Verde aquifer is derived from the Menefee and Cliffhouse Sandstone formations; water in the Dakota-Glen Canyon aquifer is derived from the Dakota and Morrison formations (Robson and Banta 1995).

More localized and shallow groundwater resources are encountered within alluvial deposits associated with the surface water drainages within the project area. These aquifers consist of Quaternary period deposits of alluvial gravel, sand, silt, and clay or Quaternary deposits of eolian sand and silt (Robson and Banta 1995). These aquifers tend to be localized near surface water and of limited aerial extent. In general, groundwater movement is from areas of recharge to areas of discharge (i.e., springs, seeps). Higher elevation mountainous and sloped areas provide the most important recharge areas based on the presence of outcrops of permeable geologic formations.

No groundwater wells were identified within the project area, based on a search of the USGS database of available groundwater data and the Colorado Water Resources Division database of water well permit applications. Specific information on groundwater use is limited within the project area, and no residential properties or windmill wells for stock watering were observed in proximity to the proposed project components.

Water quality data for groundwater in the project area is also lacking, although aquifers associated with sedimentary rocks and marine deposits are known to contain high salinity (BLM 1985) and abundant mineralization. Water quality in the deeper sedimentary aquifers may be influenced by upward movement of saline water through improperly plugged exploration holes (Robson and Banta 1995).

### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative, there would be no additional impacts to project area surface water or ground water resources. Ongoing impacts to surface water from existing surface disturbance and associated erosion from precipitation runoff would continue. The existing access road along Burro Point would remain in its current condition, and recreation activities including OHV travel would continue. Ongoing erosion and sediment transport that may occur within the proposed project area would continue. These impacts would be low and long-term.



## **Environmental Consequences – Alternative 2 (Proposed Action) and Alternative 3**

### ***Surface Water***

There are a number of sources for potential impacts to surface water quality that may occur as a result of developing the Proposed Action or Alternative 3. Disturbed project area soils would be subject to erosion by wind and/or water into nearby ephemeral washes, impacting localized surface water quality. Spills or releases of hazardous substances, production fluids, fuels, or other constituents utilized during well drilling activities could be washed into surface drainages during storm events. The absence of actively flowing (perennial) surface waters within a 1-mile radius of the project elements reduces the potential for surface water quality impacts to regional surface water resources. Potential impacts to surface water quality would be low and short-term during construction and drilling.

During operation of the wells and gathering system, potential impacts to surface water quality would be low to none and long-term, based on reclamation and stabilization of unused areas of the proposed well pads and construction corridor routes, and a decrease in use of potentially hazardous substances, chemicals, and fuels once each well is in operation.

### ***Groundwater***

Potential groundwater impacts associated with CO<sub>2</sub> resource development include:

- Migration of gas into shallow aquifers; and
- Contamination of shallow drinking water aquifers due to surface spills and releases.

Groundwater contamination, dewatering, or gas migration could occur as the result of improperly sealed surface casings during drilling, well bore stimulation activities, production, and abandonment activities. Potential releases of naturally occurring gases to groundwater include methane, hydrogen sulfide, or CO<sub>2</sub>. Although migration of gas by diffusion or through natural fractures is possible, manmade conduits account for most of the upward migration of gas to the near surface environment (USGS 1994). Potential impacts are expected to be low and long-term during drilling and operation.

Shallow groundwater quality could be impacted by leakage of fluids from transfer and transportation of drilling fluids, additives, and fuels. Proposed project design criteria would reduce the potential for this to occur. Potential impacts to groundwater resources during drilling are expected to be low and short-term. During production, impacts are also expected to be low and long-term.

### **Design Criteria**

Project design criteria that provide for protection of surface water and groundwater resources include the following: prompt reclamation of non-used areas of surface disturbance, utilization of best management practices to minimize soil erosion and sediment transport, proper lining and maintenance of reserve pits, proper well drilling and completion techniques that are reviewed and approved by a BLM Petroleum Engineer, and training of project staff on spill response and reporting requirements. In addition, Kinder Morgan would prepare project-specific Storm Water

Management Plans (SWMPs) for inclusion in the Kinder Morgan McElmo Dome Programmatic SWMP prepared in accordance with CDPHE requirements. The production pits for each of the proposed wells would be constructed and operated in accordance with COGCC requirements.

## **Cumulative Impacts**

Since there would be no direct or indirect impacts to surface water or groundwater, the Proposed Action would not contribute towards any cumulative effects.

### **8.3 Non-Critical Elements**

#### **8.3.1 Access**

The main access to the Monument is via US Highway 491, which runs generally southeast to northwest to the east of the Monument. From US 491, access to the Monument is via gravel and paved surface Montezuma and Dolores County roads. Within the Monument, access includes a combination of county roads and un-maintained two-track BLM system and non-system roads. The road network provides access for recreational and educational uses within the Monument, access to range allotments, and access to oil, natural gas, and mineral development areas.

Access to the proposed project area is via US Highway 491 and then County Road P, which travels along the mesa top area from Goodman Point to McElmo Canyon. Access to wells GP #20 through GP #25 would be via an un-maintained dirt two-track road previously constructed for the original drilling of a well that is now plugged and abandoned. As described in the Proposed Action (Section 2), the well pad construction, well drilling, and pipeline construction activities would require approximately 565 vehicle trips to the project area per well.

The access road would be re-routed in one short section (1,100 feet) to avoid a cultural resources site, but otherwise the road would remain in its current alignment. To provide access to wells GP #20 through GP #25, the existing, un-maintained dirt two-track road would be improved by applying road base material to the existing 16-foot-wide driving surface.

As part of the Proposed Action, there would be a gate placed on the access road at the intersection with County Road P. Kinder Morgan, the BLM, and the range permittee would have the key to the gate. The gate and associated barrier/fence would be constructed to allow pedestrian and equestrian access but would prohibit any type of vehicle access. A sign would be placed at the gate describing the allowed and prohibited types of access.

#### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative, the current levels of traffic would continue, and the existing transportation network would remain in place with the current improvement levels. There would be no change in access to the Burro Point area, and ongoing impacts to area roads from existing vehicle travel would continue. The existing oil and gas access road would remain open and would continue to provide public access to the area.

## **Environmental Consequences – Alternative 2 (Proposed Action)**

Implementation of the Proposed Action would cause direct impacts to the existing transportation network through increased wear on area roads. The wear on area roads would be low and short-term (primarily during construction and well drilling). If the wells are productive, the wells and pipelines would require monthly inspection, which would be completed during the ongoing inspection program conducted by Kinder Morgan for producing CO<sub>2</sub> wells within the Monument.

The closure of the existing Burro Point oil and gas access road would not cause any change to the existing transportation network as the road is an unimproved two-track road that ends at an abandoned well pad. The closure of the road would cause the loss of approximately 3.5 miles of oil and gas access road that has been utilized for recreational purposes by the general public. The closure of the access road to the Burro Point area may cause a decrease in impacts to archaeological, vegetation, and surface water resources in the area due to the potential decrease in use of the area. Those potential impacts are discussed in the relevant sections of this EA.

## **Environmental Consequences – Alternative 3**

The environmental consequences from Alternative 3 would be the same as those associated with Alternative 2. The access road would be closed as part of the action, and the additional wear and tear on roads due to construction and drilling activities would occur. Although there may be a slight increase in the area of disturbance for Alternative 3 (0.47 acres), there would not be any difference in terms of the consequences for access.

## **Design Criteria**

All vehicle travel to and from the proposed project area would be limited to the approved access roads for each location. The access roads would be constructed to BLM oil and gas exploration “Gold Book” standards. The roads would be maintained to the BLM, San Juan Resource Area road specifications and “Gold Book” standards. The proposed roads would be designed by a registered engineer, and the plans would be reviewed and approved by the BLM prior to initiation of road construction activities.

## **Cumulative Impacts**

There are currently 196 miles of roads within the Monument for access to oil and gas sites (Canyons of the Ancients National Monument Proposed Resource Management Plan and Final EIS – BLM 2009). The Monument RFD document (BLM 2005a) estimates that future oil and gas development activities within the Monument would require approximately 67 miles of additional roads over the 20 year period from 2005 to 2025. The proposed access roads constructed to the two new well pad locations and the alternate access to the existing well (1,676 feet/0.32 miles) would be included within the 67 miles of new oil and gas access roads that would be constructed within the Monument. The overall access to the Burro Point area would be controlled at the intersection with the County Road P, so the new roads would not add to areas of public access within the Monument. The length of new roads represents 0.16% of the existing oil and gas access roads within the Monument. Implementation of the Proposed Action would cause short-term increases in traffic during well drilling activities; however, the increase in traffic

would not cause impacts to the level of service on area roads. No long-term impacts to traffic patterns would occur with implementation of the Proposed Action.

### **8.3.2 Fire**

Many species in the southwest are fire-adapted because they evolved with fire as a regular component of the ecosystem. Piñon-juniper woodlands dominate the portion of Burro Point that surrounds the location of the Proposed Action. This vegetative community experiences a fire regime ranging from “frequent, low intensity fires to rare, high intensity, stand replacing fires (BLM 2009, page 141).” Aerial photographs show that the Monument has experienced an increase in the density of piñon-juniper stands over the last 40 years, with 60-90 percent mortality (Ibid, page 142).

According to Kevin Joseph, DPLO Fire Management Officer, fire exclusion for most of the 20<sup>th</sup> century, combined with the presence of dense, immature stands of piñon-juniper as a result of chaining done in the 1970’s, and infestations of cheatgrass in the understory, have increased the fuel load in this area. The dense, dead, standing fuels can provide a near continuous source of fuel, and therefore has increased the fire risk. This type of fuel loading, combined with adverse fire weather conditions, could result in a high severity fire (Joseph 2009).

There have been no prescribed burns or other fuels reduction projects conducted in the general vicinity of the proposed project. The areas adjacent to the existing access road on the Burro Point are open to public firewood collecting. The area has been utilized for public firewood collection due to the presence of down woody material from past chaining activities. These areas are open for public fuel wood collection to help reduce fuel loads and fire hazard in areas where chaining activities have generated dead and down fuel wood.

#### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative, there would be no change in project area fire hazard potential. On-going firewood collection by the public would continue, and potential sources of ignition in the area (recreation users, lightning strikes, etc.) would continue to be present.

#### **Environmental Consequences – Alternative 2 (Proposed Action) and Alternative 3**

Potential impacts associated with Alternative 2 and Alternative 3 would include an increased fire hazard as a result of a short-term increase in human presence in the project area and an increase in ignition sources during well drilling and completion, and pipeline construction activities. The project area does have natural and man-made fire breaks in the general vicinity (sandstone cliff faces and exposed bedrock areas, cleared agricultural lands and roads, and utility transmission lines).

Implementation of Alternatives 2 or 3 would close the Burro Point area to public access, so public firewood collecting would no longer occur. This may cause a slight increase in the potential for higher-severity fires by allowing more down woody material to remain in the project area. Impacts created by an increase in fire danger would be low to moderate and short-term during construction and low to moderate and long-term during production operations.

## **Design Criteria**

All Kinder Morgan employees would be briefed on fire hazards in the area and are committed to the prevention of human-caused fires.

## **Cumulative Impacts**

Past actions that may have the potential to influence fire danger include: previous chaining activities to improve rangeland resources, previous grazing activities, and a history of fire exclusion on public lands. The following ongoing activities also have the potential to increase fire danger: existing utilities present in the area, traffic through the area, recreation activities, ongoing oil and gas and mineral development activities, and cultural research activities. All of these activities would also have the potential to increase fire danger in the future. Implementation of the Proposed Action would not cause a measurable increase in fire danger within the project area.

### **8.3.3 Geology and Minerals**

The proposed project area is located on Burro Point between Yellow Jacket Canyon to the north, and Rock and Sand Canyons to the south. The uppermost geologic strata exposed in the canyon walls are the sandstone cliffs of the Dakota and Burro Canyon formations, which are of cretaceous age. Below the Dakota Sandstone layer are various sandstone and shale layers associated with the Morrison formation of Jurassic Age. Unconsolidated canyon bottom material consists of modern alluvium material generated in the Quaternary age.

The proposed well pads, flow lines, and production line are generally located adjacent to existing roads and pipeline ROWs along the top of the Burro Point. The cliff edges on the mesa sides are moderately to steeply sloped with areas of exposed sandstone bedrock cliffs. The Burro Point is approximately 0.25-mile wide, with Burro Canyon running west from Burro Point. Slopes on the mesa top area are generally 2 to 5% with varying aspects. The elevation of the general project area ranges from 6,400 to 6,700 feet.

Mineral resources within this section of the Monument are primarily CO<sub>2</sub> deposits associated with the McElmo Dome formation. The McElmo Dome is described as the largest currently producing CO<sub>2</sub> deposit in the world (Paulson and Baker 2006).

### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative, there would be no additional impacts to project area geologic and mineral resources. Ongoing oil and gas production activities in the general vicinity of the Burro Point area would continue at their current levels. Depletion of mineral resources associated with these existing development activities would continue at their current levels.

### **Environmental Consequences – Alternative 2 (Proposed Action) and Alternative 3**

Blading, excavations, and trenching during construction activities would cause slight alterations to the existing topography of the well pad areas and access road/flow line routes. These impacts would be low and long-term.

The proposed development activities would provide for production of CO<sub>2</sub> resources from subsurface geologic formations. The proposed development would reduce the amount of mineral resources present within the developed formation. It is difficult to predict the amount of mineral resources that would be produced and what volume would remain after wells are no longer productive. Therefore, the potential impacts to mineral resources could range from low to high and would be long-term.

### **Mitigation Measures**

No mitigation measures for impacts to geology and mineral resources are necessary.

### **Cumulative Impacts**

Cumulative impacts associated with Geology and Minerals include the removal of the resource and surface impacts associated with the mineral development activities. The reduction in mineral resources associated with development activities within the Monument has been quantified in the document 'Reasonable, Foreseeable Development: Oil, Natural Gas and Carbon Dioxide in Canyons of the Ancients National Monument' (BLM 2005a) prepared by the San Juan Public Lands Center – Fluid Minerals staff. The McElmo Dome Unit is estimated to have sufficient CO<sub>2</sub> resources to provide 50 years of production with increases in production rates (BLM 2005a – page 28). The Proposed Action is considered part of the reasonable foreseeable development scenario analyzed by the BLM Fluids Mineral staff.

The following is a description of cumulative impacts to surface resources associated with mineral development activities for the proposed project area. The 1991 Oil and Gas Amendment (BLM 1991 p. 4-30) for the San Juan/San Miguel Planning Area estimated that approximately 2% (1,430 acres) of the surface area within the management area would be impacted by oil and gas activities by 2009. This estimate considers the potential drilling of 313 wells with an average surface disturbance of 4.0 acres per well (BLM 1991 pp. B-2 and B-49). The total disturbance for the Proposed Action is approximately 27.6 acres, which represents 0.02% of the land area within the Monument. The BLM prepared a RFD document for oil, natural gas, and CO<sub>2</sub> development within the Monument in April 2005 (BLM 2005a). The RFD document states that 185 wells have been drilled within the Monument since the 1940s (p. 1), with an additional 150 wells estimated to be drilled in the next 20 years. Of these wells, 69 of the proposed new wells would be CO<sub>2</sub> wells (p. 1). Kinder Morgan's six proposed wells would be within the number of wells estimated in the RFD document.

A review of COGCC records (COGCC 2009) within the project area was made to quantify existing oil and gas disturbance within a 1-mile and 5-mile radius of the proposed project area. The summary of 1- and 5-mile radius area provides a nearby (1 mile) and general vicinity (5 mile) summary of the density of mineral development activities.

Existing or previous oil and gas development located within a 1-mile radius of the proposed project area consists of seven permitted locations, one temporarily shut-in well, and two abandoned wells. Within a 5-mile radius of the proposed project area, there are 119 well pad locations, as broken down in Table 7. The area searched within a 1-mile radius is 10 square miles or 6,400 acres. The area searched within a 5-mile radius is 100 square miles or 64,000 acres. Based on 4 acres of disturbance per well pad, the percent of impacted land from well pads is

0.2% and 0.5% within 1-mile and 5-mile radius respectively. The additional 6 wells would put the area of disturbance percentage at 1.8 % within a 1-mile radius. The amount would be less than the 2% of the area predicted in the 1991 RMP amendment. The addition of 6 wells to the area of disturbance within a 5-mile radius would be less than 0.1% increase in the area disturbed by well pads.

**Table 7. Existing wells located within a 1-mile and 5-mile radius of proposed project area.**

Type of Well	1-mile radius	5-mile radius
Abandoned Location	-	-
Drilled and Abandoned	-	-
Injection well	-	-
Plugged and Abandoned	2	24
Producing	0	26
Shut-in	-	15
Temporarily Abandoned	1	1
Permitted Location	7	53
Compressor Stations	0	1

Source: Colorado Oil and Gas Conservation Commission 2009.

The only record for a compressor station within a 5-mile radius of the proposed project area is for the Kinder Morgan Goodman Point Compressor located on private land to the east of the proposed project area. The existing Kinder Morgan Goodman Point Compressor Station includes the compressor and gas treatment building, office building, and parking and access areas. The facility includes the following components:

- Separation and testing vessels;
- Storage tanks for water and glycol (used for dehydration);
- Dehydration equipment (contactor, glycol reboiler, utility pumps, etc.);
- Two (2) 5,000 horsepower reciprocating compressors, electrically driven, with fin fan coolers; and
- Other utility equipment as needed.

After the “wet” gas from the proposed wells has been treated at the facility, it would be sent to the existing Cortez Pipeline through the Sand Canyon “dry gas” flow line that runs parallel to County Road N.

Kinder Morgan has drilled an additional 10 CO<sub>2</sub> production wells on private lands in the vicinity of the compressor station. The produced CO<sub>2</sub> is being collected, treated, and transported through the existing Goodman Point Compressor Station. Kinder Morgan has also submitted sundry notices for recompleting the existing Sand Canyon #6 well pad, which would include a flow line that would connect with the proposed production line for the Proposed Action. The existing reclaimed well pad would be utilized for the recompletion activities, and the flow line would be constructed within an existing Kinder Morgan ROW area. Therefore no new disturbance would be required for this recompletion project.

The proposed activities within the Monument represent Kinder Morgan's reasonable foreseeable development for the next 5 years. The removal of the mineral resource would combine with past present and anticipated future removals to reduce the amount of mineral resources present within the target formations.

### **8.3.4 Health and Safety**

The proposed project area does not currently have any oil and gas or CO<sub>2</sub> production wells in operation. There are three abandoned well locations within a 1-mile radius of the proposed project area (see Figure 5) and there are ten active Kinder Morgan CO<sub>2</sub> production wells located east of the project area outside of the Monument boundary. The primary health and safety concerns within the proposed project area include: vehicle travel on existing access roads and operation of existing utilities. The following utilities are present on or near the proposed well sites:

- Empire Electric Association 115 kV transmission line runs generally west to east parallel to County Road P; and
- Kinder Morgan - CO<sub>2</sub> "dry gas" flow line that runs generally parallel to County Road P.

#### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative, there would be no increase in project area health and safety hazards. Ongoing sources of health and safety concerns (travel on gravel roads and operation of existing utilities) would continue at current levels.

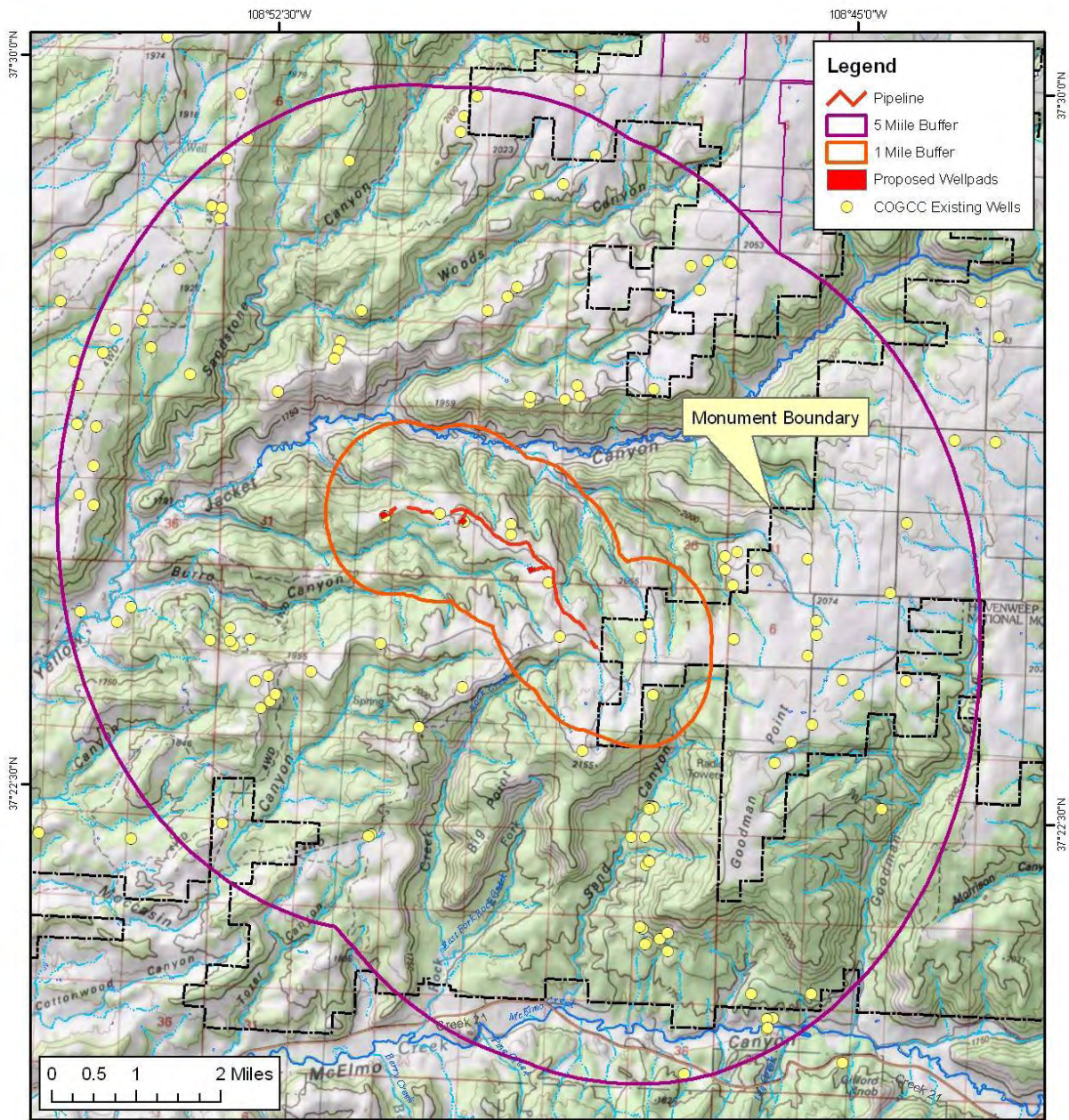
#### **Environmental Consequences – Alternative 2 (Proposed Action)**


Implementation of the Proposed Action would result in an increase in occupational health and safety hazards to operators during the construction, drilling, and operation of the proposed project. There would also be slight potential for impacts to the general public. Health and safety hazards associated with drilling of the proposed wells include: H<sub>2</sub>S gas releases, noise exposure, high-pressure liquid hazards, physical hazards associated with work in the vicinity of moving objects, and chemical hazards. Releases of H<sub>2</sub>S would occur while drilling through shale formations that contain high concentrations of the gas. H<sub>2</sub>S is a potentially lethal gas with an Immediately Dangerous to Life or Health (IDLH) concentration of 250 parts per million (NIOSH 1985).

Existing utility infrastructure present within the project area represents health hazards for construction activities. Damage to any of these facilities during project construction, operations, and maintenance represent health and safety risks to workers and to the general public.

Alternative 2 would include sections of pipeline (1,474.3 feet/0.28 miles) that would be installed above ground ("bedded" on the ground surface). The installation of aboveground pipeline would represent a physical hazard due to the presence of 12-inch steel pipeline on the ground. The presence of a pressurized pipeline on the ground would also represent a public health hazard from possible puncture of the pipeline due to vehicle accidents or impact from firearm discharges.





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	FIGURE 5	EXISTING GAS WELLS
	TOWNSHIP 37N RANGE 18W, SECTIONS 32, 33 & 34	MONTEZUMA COUNTY, CO
TOWNSHIP 36N RANGE 18W, SECTIONS 2 & 3	5/1/09	

**Figure 5. Existing Gas Wells**

Indirect impacts to health and safety may occur due to an increase in traffic that may cause an increase in vehicle accidents. These impacts would be short-term (less than 6 months) as the impacts would be primarily during the well pad construction, well drilling, and pipeline construction period.

Potential impacts from the release of hazardous materials and physical hazards would be low to moderate and short-term during construction and drilling and low and long-term during production operations.

### **Environmental Consequences – Alternative 3**

The environmental consequences associated with Alternative 3 would be the same as those associated with Alternative 2 with the exception of the complete burial of the production line within the ROW area for the existing road. The complete burying of the pipeline would reduce the potential for any type of human-caused accident (pipeline rupture, vehicle damage to the pipeline, or tripping or falling around the pipeline).

### **Design Criteria**

The following project design criteria would be implemented to specifically address health and safety hazards associated with drilling of the proposed wells. Kinder Morgan has an H<sub>2</sub>S Contingency Plan that minimizes the potential for releases of the gas during drilling activities, and also provides safety response measures in the case of releases of H<sub>2</sub>S at a drill site. Signs would be posted as necessary on the proposed project facilities that identify potential hazards associated with its operation, including H<sub>2</sub>S gas releases, work in the vicinity of high pressure equipment, and chemical release hazards. Equipment operators would be required to wear appropriate personal protective equipment to minimize exposure to these hazards. Material Safety Data Sheets for any treatment chemicals would be maintained onsite during the construction phase.

A manned safety station would be set up in the road adjacent to all of the well drilling locations to control public access to the drilling locations, and a tested H<sub>2</sub>S Contingency Plan would be used during drilling of the Proposed Action. Access to the Burro Point area would also be controlled by installation of a gate at the intersection of the access road with County Road P. The installation of a controlled access gate would reduce the potential for vehicle damage to the aboveground pipeline and the potential for impacts from bullets.

### **Cumulative Impacts**

Cumulative impacts to health and safety would include worker safety impacts associated with well pad construction and well drilling activities, and public health and safety impacts associated with increased traffic on area roads. Implementation of the Proposed Action would represent a continuation of current levels of development associated with on-going mineral development activities within the Monument. On-going well pad construction activities and well drilling activities contribute impacts to worker health and safety, and the Proposed Action would contribute to these impacts. Travel on roads within the Monument represents a potential risk for worker safety and the general public, and the Proposed Action would contribute to these risks

with a short-term increase in traffic (associated with well drilling activities). Overall, the Proposed Action would represent a continuation of current levels of impacts.

### **8.3.5 Law Enforcement**

Law enforcement activities within the Monument include enforcement of Colorado and Federal rules and regulations regarding criminal actions, protection of terrestrial and aquatic wildlife, and protection of archaeological and cultural resources. Law enforcement activities are carried out by several agencies that work and support each other through cooperative agreements and memorandums of understanding. The nearest BLM law enforcement officers are stationed at the Anasazi Heritage Center.

#### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative, ongoing law enforcement activities would not change. Random patrols through the Monument would continue, and response to reports of criminal activities would continue. Under the no action alternative, the existing oil and gas access road to the Burro Point area would remain open to the public and may require patrol by law enforcement officers.

#### **Environmental Consequences – Alternative 2 (Proposed Action) and Alternative 3**

Implementation of the Proposed Action or Alternative 3 has the potential to impact law enforcement activities due to increases in traffic to the project area, which would increase the potential for traffic accidents on roads within the Monument. The Proposed Action would include the installation of a controlled access gate at the intersection of the Burro Point access road and County Road P. The gate would control public access to the new well pad areas and the Burro Point in general. The access control would also reduce the potential impacts that occur from user-created roads (potential for vandalism and pot hunting at existing cultural resources sites).

The increase in potential traffic accidents would be a low and short-term, and would occur during the construction and well drilling phase of the project. long-term

#### **Mitigation Measures**

No mitigation measures for law enforcement are recommended.

### **8.3.6 Noise**

The proposed well sites are located in areas with limited access and moderate existing activity levels related to oil and gas and mineral development. Additional background noise is created from access to the area for recreational use, firewood gathering, and grazing management. No background noise studies have been conducted for the project study area. There are no residences or businesses located within approximately 2 miles of the proposed project area.

Ambient sound levels in the project study area vary greatly, depending on proximity to existing facilities, roadways, or other sources. The proposed well sites and flow line routes are generally located adjacent to or in the general vicinity of existing gravel, connector roads primarily used for oil and gas development. The sound levels would fluctuate with variations in weather

conditions including temperature, wind and humidity, and the general topography of the area. Private land holdings surrounding BLM lands are primarily rural.

### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative, noise levels would continue at their current levels

### **Environmental Consequences – Alternative 2 (Proposed Action) and Alternative 3**

During construction of the Proposed Action or Alternative 3, there would be a direct short-term increase in project area ambient noise levels due to the operation of heavy equipment. Construction noise would range from 80 to 93 decibels (acoustic) (dBA) during the operation of a grader, 80 to 82 dBA using a bulldozer, and 83 to 94 dBA using a truck (EPA 1974). Drilling rig noise levels [74 dBA at 200 feet (USGS 1981)] would be expected to exceed other heavy equipment on location. The direct impact would be moderate and short-term. Noise impacts are expected to decrease during long-term operation and maintenance, and would be dependant on the type and size of compressor or pumping equipment installed at the well (if any) to increase production of CO<sub>2</sub>. Operational impacts would be low and long-term. Noise impacts during operation of the well would be limited to vehicular access and maintenance activities.

Under Alternative 2 or Alternative 3, impacts from increases in area noise generation would be high and short-term during construction and drilling, and low and long-term during production operations.

### **Design Criteria**

Site workers would follow Federal Occupational Safety and Health Administration requirements for hearing protection during proposed construction and drilling activities. The active well drilling areas would be secured from public access to avoid any excessive noise exposure to the general public.

### **Cumulative Impacts**

Ongoing sources of noise within the proposed project area include: traffic on area roads, mineral development activities on public and private land in the general vicinity of the proposed project area, and recreation activities occurring in the general vicinity. These noise levels are highly variable depending on the time of day and the season. Future activities that may increase noise levels may include additional mineral development activities and additional traffic on area roads.

### **8.3.7 Paleontology**

A review of the Monument paleontological records for the Proposed Action was conducted, and there are no known paleontological localities in the area of the Proposed Action. The area of the Proposed Action is located within the paleontology classification condition 3, an area considered unlikely to produce vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils based upon surficial geology.



### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative, impacts to paleontological resources from the proposed project would not occur.

### **Environmental Consequences – Alternative 2 (Proposed Action) and Alternative 3**

There would be no impacts to paleontological resources under Alternative 2 or Alternative 3.

### **Cumulative Impacts**

Past and present impacts to paleontological resources in the Monument occur from ongoing weathering, ongoing research activities that may modify the resources, and vandalism or theft of the resources. Since the proposed project area does not contain any known paleontological localities, and the potential for the occurrence of fossils is low, the Proposed Action is not expected to provide a contribution towards a cumulative effect to paleontological resources within the Monument.

#### **8.3.8 Rangeland Management**

Grazing is a prominent land use in the proposed project area and general vicinity. The entire Burro Point area was designated as a Livestock Management Emphasis Area in the San Juan/San Miguel RMP (BLM 1985). The proposed project area would be located within a common use permitted livestock allotment – the Burro Point Community Allotment (#08000). The allotment has three separate permittees that utilize the allotment. The allotment is permitted for 1,083 active Animal Unit Months (AUMs) and 134 suspended AUMs. A Rangeland Health Assessment was completed for the allotment in 2003. The assessment indicated that the allotment was not meeting the rangeland health standards (Mike Jensen, pers. comm.).

### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative, the proposed project would not occur and there would be no impacts to project area range conditions.

### **Environmental Consequences – Alternative 2 (Proposed Action) and Alternative 3**

Loss of vegetation in the proposed project area would occur due to blading work areas, clearing vegetation, and trenching in pipeline route areas. A maximum of 27.6 acres of vegetation would be removed as a result of the development of the Proposed Action. The removal of vegetation could reduce the amount of forage available for cattle and increase the potential for noxious weed infestations in the project area. The reduction in forage impact would be moderate and long-term, as there would be a noticeable change in the composition of the project area vegetation. The magnitude of impacts would not affect overall management activities within the allotment. After reclamation of disturbed areas has been completed, reseeding may enhance the production of forage with the proposed project area. This impact would be long-term and positive. The overall impact of the project activities would be monitored as part of the ongoing rangeland health assessment activities.

Operation of the proposed wells and flow lines would not be expected to affect the surrounding flora, and impacts would be expected to be low and long-term. No impacts to existing fences or cattle guards would be expected. No new fences or cattle guards would be constructed for the project.

### **Mitigation Measures**

These potential impacts would be minimized by the implementation of mitigation measures (BLM Surface Use COAs). Impacts to range forage from site clearing activities would be minimized through prompt reclamation of the unused portions of the proposed project area, with a weed-free BLM-approved seed mix (Table 6).

As required in the Surface Use COAs (Reclamation COA #11 - Appendix A), all areas that are reclaimed would be fenced until seedlings are well established and stable to improve site reclamation. Typically, the fence would remain in place for a minimum of 3 years, and would then be removed by Kinder Morgan upon instruction from BLM. If initial seeding is not successful as determined by the BLM, repeat seeding by Kinder Morgan within reclaimed areas may be required to successfully establish native vegetation.

### **Cumulative Impacts**

Past actions that have impacted range resources within the proposed project area include: chaining activities that reduced the canopy cover, grazing activities, road and utility construction activities, and variations in climatic conditions. Ongoing and future activities that influence rangeland conditions include: mineral development activities, recreational activities, and ongoing rangeland utilization. The two main influences on rangeland conditions would continue to be climatic conditions and rangeland stocking levels. Implementation of the Proposed Action would cause minimal changes to range resources, below any level that would cause changes to current management activities.

#### **8.3.9 Recreation Resources**

Recreation management guidelines for BLM lands, including a description of the classes of recreation opportunities (Recreation Opportunity Spectrum [ROS]), are provided in the San Juan/San Miguel RMP (BLM 1985). No Intensive/Special Recreation Management Areas, as defined in the San Juan/San Miguel RMP, occur within the boundary of the Monument. There are no designated recreational trails or recreation sites within the proposed project area or the general vicinity of the proposed project area. Moqui Lake, an informal recreational site, is located approximately 2 miles southwest of the GP #20 and 21 well pad location (see Figure 2).

The public may periodically undertake the following recreational activities in the project area: hunting, hiking, mountain biking, birding, bouldering, driving for pleasure, and horseback riding. The interim management guidelines for the Monument (BLM 2001b) do not allow any off-road travel by motorized vehicle or bicycles. Recreational use of bicycles and OHVs within the Monument is restricted to existing roads and designated trails.

The area surrounding the proposed well pads GP #20 through GP #25 (Burro Point area) currently meets a ROS setting of Semi-Primitive Motorized (SPM). Use levels and social encounters are low; access is on a narrow, un-maintained dirt two track; facilities are few and evidence of active management is low; and the setting is predominantly natural appearing.

### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative, there would be no impacts to project area recreation resources. The existing condition of ROS Class SPM would be maintained within the Burro Point Area. The existing oil and gas access road that provides public access to the Burro Point area would remain open. Off-road travel within the project area would likely continue.

### **Environmental Consequences – Alternative 2 (Proposed Action) and Alternative 3**

Impacts to area recreation opportunities because of the proposed mineral development activities would primarily be a result of the effects to four setting indicators: access, remoteness, naturalness, and facilities and site management. These effects are expected to be moderate and long-term. The visible elements of well hardware, including pipe and valves; visible evidence of active management; and changes to the natural setting as a result of surface disturbance would last longer than 5 years. The impacts would be moderate (easily detected) for the long-term during the production life of the wells.

Public use of the area for limited dispersed recreational purposes would decrease due to the closure of the existing oil and gas access road for public utilization. The closure would not alter pedestrian and equestrian usage of the access road, but it would eliminate OHV utilization of the project area. These impacts would be moderate and long-term. The presence of industrial facilities in the area during the drilling and construction phases of well development may also influence recreational activities within the general vicinity of the proposed project area.

The impacts of construction activities would be moderate and short-term. For the long-term, for the GP #20 through #25 area, the proposed increase in the level of development and associated activities would change the recreation setting from an ROS of SPM to Roded Natural (RN).

### **Design Criteria**

Kinder Morgan would provide public notices, signs, and precautions necessary to protect the health and safety of the public during construction and drilling activities. In addition, a staffed safety station would be setup in the road adjacent to all of the well drilling locations to control public access to the drilling locations. Visual impacts would be mitigated as described in Section 8.3.13.

### **Cumulative Impacts**

The proposed project area does not contain any designated recreation areas managed by Canyon of the Ancients National Monument. Informal recreational use of the project area would continue during and after project construction activities are completed, with motorized use eliminated due to the gating of the access road for control of public vehicle access. It is assumed that recreational use within the proposed project area and general vicinity would continue at current

levels, with changes occurring in the type and location of usage due to the installation of the controlled access gate.

### **8.3.10 Socioeconomics**

The Proposed Action would increase CO<sub>2</sub> production from the McElmo Dome Unit by about 150 million cubic feet per day (approximately 15% increase above present production). This additional production would increase the amount of CO<sub>2</sub> that is transported by pipeline to West Texas for enhanced oil recovery.

The primary socioeconomic impacts associated with changes in CO<sub>2</sub> production are changes to local employment, income, and tax revenues. In 2005, 2% of employment and 4% of income in Montezuma County were derived from mining and utility sector jobs (BLM 2009). Because mining sector jobs have the highest average wage in Montezuma County, these jobs have a relatively large impact on total income (BLM 2009). Kinder Morgan is one of the major employers in this sector in Montezuma County. Carbon dioxide properties and production currently comprise 50% of the property tax revenues in Montezuma County and are used to fund schools, special tax districts, and county operations (BLM 2009).

#### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative, the current levels of positive and negative impacts to project area socioeconomics would continue. It is likely that under the No Action Alternative the additional CO<sub>2</sub> production would eventually be developed on private land and other federal leases. Therefore, the increases in local employment, investment, and tax revenues associated with the Proposed Action could be realized even under the No Action Alternative.

#### **Environmental Consequences – Alternative 2 (Proposed Action) and Alternative 3**

The Proposed Action and Alternative 3 are expected to support five jobs during construction, drilling, completion, and operation of each well (see Section 2.1.2). As a result of the expansion in CO<sub>2</sub> production, Kinder Morgan is adding six new full-time jobs in Montezuma County for a total of 46 full-time employees. These new jobs would have a relatively large impact on income in Montezuma County because of higher average wages. Furthermore, increased CO<sub>2</sub> production volume and associated equipment would increase property tax revenues in Montezuma County. Although, the tax revenues generated annually fluctuate with CO<sub>2</sub> production and market prices, the Proposed Action is anticipated to increase property and associated severance tax revenues for Montezuma County in the long-term (BLM 2009).

Overall, there would be minor and short-term beneficial economic impacts for a variety of contractors and businesses as a result of development of the Proposed Action. Additionally there would be minor and long-term beneficial economic impacts related to increased employment, income, and tax revenues in Montezuma County.

#### **Mitigation Measures**

No mitigation measures for socioeconomic impacts are recommended.



## **Cumulative Impacts**

An analysis of the cumulative effects of mineral development activities for the entire Monument is provided in Section 3.4.2 of the Proposed Canyons of the Ancients National Monument RMP and Final EIS (BLM 2009).

### **8.3.11 Soils**

Surficial soils within the proposed project area are primarily associated with the Morrison Formation, Dakota Sandstone, and Burro Canyon geologic formations. Soil parent materials are predominantly colluvium, alluvium, and residuum, as well as eolian material and sources from sandstone and shale. Areas of biological or cryptogamic soil crusts in the soil surface of the project area are infrequent.

The proposed project area soils are generally composed of red loess soils with sandy to silty textures. Specific soil types include Wetherill Loam, Gladel-Pulpit Complex and Romberg-CrossCan-Rock Outcrop Complex. Soil depths vary with distance from the rock outcrop areas (canyon edges), with thicker soil layers present in the middle of the mesa areas. Additional specific soil characteristics are provided in the report *Soil Survey of Cortez, Parts of Dolores and Montezuma Counties* prepared by the Natural Resource Conservation Service (NRCS 2001).

The Standard for Public Lands Health for upland soils is being met in the proposed project area. Soils observed in the general project area show minimal erosion impacts. Ground cover on these sites exhibits higher than expected areas of bare ground and lower than expected biological crust diversity and litter cover. The over-story vegetation lacks diversity and cover. Many of the expected species that would help intercept rainfall, improve infiltration, and reduce runoff are missing or only present in minor amounts. The condition of these rangeland health indicators puts the site at risk to erosion. However, because the mesa top has little to no slope, the risk of potential erosion is limited. The large woody debris remaining from the chaining activity (1970's) also helps to slow overland flow.

#### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative, recreational uses in the project area would continue, with off-road travel contributing to erosion of surface soils. Grazing impacts that would affect soils would also continue.

#### **Environmental Consequences – Alternative 2 (Proposed Action)**

The Proposed Action would result in temporary displacement, compaction, and mixing of soils in the project area. Accidental spills or releases of hazardous substances could result in soil contamination requiring remediation or removal. Due to the susceptibility of the project area soils to wind and water erosion, construction activities would indirectly cause loss of upper soil layers. Reduced capacity for plant growth due to removal and/or disturbance of the soil would be an additional direct effect.

Direct impacts to project area soils due to well pad clearing, and access road and pipeline construction would be confined to within the project area (27.6 acres). Topsoil would be

segregated and utilized for interim reclamation within short-term (less than 6 months) disturbance area (8.23 acres). Project Design Criteria would be implemented during the operation and maintenance phase of the Proposed Action, and would provide soil stabilization and reclamation of unused areas, reducing the amount of soil disturbance.

These impacts are expected to be low to moderate and short-term, with a reduction to low and long-term through stabilization and reclamation activities after construction and drilling. The impact to soils during the operation and maintenance phase would be low and long-term.

### **Environmental Consequences – Alternative 3**

The environmental impacts to soils would be at similar levels to those described for Alternative 2. There would be a slight increase in impacts to soils due to the increase in area necessary for the installation of the entire length of the north flow line below grade. The difference in acreage of soils impacted (27.6 acres for Alternative 2 vs. 28.1 acres for Alternative 3) represents a 2% increase in area of soils impacted. The increase in area would represent a low level of impact as described for Alternative 2.

### **Design Criteria**

Kinder Morgan would utilize best management practices (BMPs) to control erosion during construction of the proposed project and during site reclamation. Vehicle and pedestrian traffic would be restricted to the county road and unmaintained dirt two-track road to prevent further soil mixing and compaction, vegetation and biological crust disturbance, and site disturbance outside the proposed project area. Spills or releases of hazardous or solid wastes would be removed and disposed in accordance with State, Federal and any local regulations.

### **Mitigation Measures**

Mitigation measures included in the project COAs (Appendix A) for construction and operation of the well pad and access road include stockpiling topsoils and prompt reclamation of non-used areas of the well pads, access roads, and pipeline routes. Reclamation activities would include: reseeding unused areas with a weed-free, BLM-approved seed mix to stabilize soils and to prevent erosion.

Additional COAs that would reduce impacts to soils include the following: construction activities would not be conducted during extended wet periods; the well pad area would be bermed to minimize offsite migration of disturbed soils; and vehicle and pedestrian traffic would be restricted to the well pads, access roads, and flow line alignments or established roads to prevent further soil mixing and compaction outside the proposed project area. Upon plugging and abandonment of the wells, the entire well pad areas, access roads, and pipeline routes would be reclaimed and reseeded to BLM specifications.

### **Cumulative Impacts**

The chaining (removal of trees) of the Burro Point area is the main past activity that would have impacted project area soils. Past grazing activities may have also caused localized impacts to soils. Current activities that may impact soils include mineral development activities, grazing activities, and formal and informal recreation activities. These activities also represent the

primary activities that would potentially impact soils in the future. The re-completion of the SC #6 well pad and construction of a flow line within the existing ROW area would also be a source of short-term impacts to soils in the general vicinity of the project area but would not contribute towards any cumulative impacts to soils within the project area and the Burro Point mesa top area.

### 8.3.12 Sensitive Species

There are 35 BLM sensitive species with potential to occur in the proposed project area. The list includes BLM sensitive species compiled from the Colorado BLM State Director's Sensitive Species List (BLM 2000b), Information Bulletin No. CO-2000-14, and consultation with the BLM Wildlife Biologist and Botanist.

Of the listed sensitive fauna that were considered in this EA, potential habitat exists within or adjacent to the project area for eight species: longnose leopard lizard (*Gambelia wislizenii*), peregrine falcon (*Falco peregrinus anatum*), Townsend's big-eared bat (*Corynorhinus townsendii*), spotted bat (*Euderma maculatum*), Allen's (Mexican) big-eared bat (*Idionycteris phyllotis*), fringed myotis (*Myotis thysanodes*), Yuma myotis (*Myotis yumanensis*), and big free-tailed bat (*Nyctinomops macrotis*). After field inspection, habitat does not exist within the project area for the longnose leopard lizard since the proposed well-pads occur in an area denuded of piñon-juniper trees (GP #22 and 23) or the understory vegetation is too dense (GP # 24 & 25 and GP #20 & 21). Likewise, habitat does not exist for the peregrine falcon since the cliffs adjacent to the project are relatively small and more suitable cliffs are adjacent to Yellow Jacket Canyon about 1 mile from the project area. In addition, the project area and vicinity provides potential habitat for golden eagle (*Aquila chrysaetos*) and Mesa Verde nightsnake (*Hypsiglena torquata loreala*), two species specifically mentioned in the Monument Proclamation (2000). Golden eagles are also listed as a BCC by the USFWS. A summary of the sensitive species considered in this EA, their habitat requirements, and Colorado Natural Heritage Program status are provided in Table 8.

BLM biologist Paul Morey conducted a site assessment on December 17, 2008, to evaluate the potential habitat for raptor species (peregrine falcon and golden eagle) within or adjacent to the project area. The cliffs adjacent to the project area are not steep enough and do not provide ledges suitable for peregrine falcons and golden eagles to nest on. Suitable cliffs exist in the area; however, they are located greater than 0.5 miles from all three twinned well sites and therefore project activities would occur outside of any nest buffers. The canyon bottoms on either side of the twinned well site #22 and 23 likely provide good hunting grounds for these two raptors and both species may use the project area for foraging.

These cliffs also provide foraging/roosting habitat for six bat species: Townsend's big-eared bat, spotted bat, Allen's (Mexican) big-eared bat, fringed myotis, Yuma myotis, and big free-tailed bat (Adams 2003). The project area's piñon-juniper woodlands provide foraging habitat for all of these bat species. Water, a limiting factor for bat populations in arid habitats, is available in stock ponds, springs and seasonal streams in the vicinity of the project area. The rocky cliffs adjacent to the project area provide suitable roost sites for spotted bats and big free-tailed bats. However, there is no potential breeding habitat (mines, caves) for the remaining bat species in the vicinity of the project area.

**Table 8. BLM sensitive species with potential to occur within the Dolores Public Lands Office Management area and/or the proposed project area.**

Common Name	Scientific Name	CNHP Status	Habitat	Potential to Occur in Project Area (PA)
<b>MAMMALS</b>				
Allen's big-eared bat	<i>Idionycteris phyllotis</i>	No CNHP status	Roosts are associated with mines/caves. Known to forage in piñon-juniper woodlands.	May occur foraging in piñon-juniper habitat adjacent to the project area; no mines or caves in the PA or vicinity.
Big free-tailed bat	<i>Nyctinomops macrotis</i>	S1	Rocky cliffs with crevices and fissures required for roosting.	May occur foraging/ roosting in the rocky cliffs adjacent to the PA.
Spotted bat	<i>Euderma maculatum</i>	S2	Cliff dwellers with diurnal roosts in cracks and crevices of canyons and cliffs. Known to forage in piñon-juniper woodlands.	May occur foraging in piñon-juniper habitat adjacent to the project area; no mines or caves in the PA or vicinity.
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	S2	Dependent on availability of abandoned or inactive mines.	May occur foraging in piñon-juniper habitat adjacent to the project area; no mines or caves in the PA or vicinity.
Fringed myotis	<i>Myotis thysanodes</i>	S3	Breeds in caves and forages in piñon-juniper woodlands.	May use cliffs adjacent to PA for roost sites; no caves in the PA or vicinity
Yuma myotis	<i>Myotis yumanensis</i>	No CNHP status	Requires surface water and suitable roost sites in mines or caves.	May occur foraging/ roosting adjacent to the PA; no perennial water sources in the PA or vicinity.
<b>BIRDS</b>				
Peregrine falcon	<i>Falco peregrinus anatum</i>	S3B	Prefers open country and high vertical cliff areas for nesting (>200 feet).	Potential nesting habitat on cliffs adjacent (1 mile away) to the PA.
<b>REPTILES and AMPHIBIANS</b>				
Long nose leopard lizard	<i>Gambelia wislizenii</i>	S1	Generally below 5200 feet in extreme western Colorado associated with desert shrub.	Potential habitat for long nose leopard lizard does not exist on the proposed well pads, but may occur on Burro Point.
<b>PLANTS</b>				
Jones' bluestar	<i>Amsonia jonesii</i>	S1	Runoff-fed draws on sandstone in piñon-juniper and desert scrub habitats (3900-7000 feet).	PA is in piñon-juniper habitat within the known elevational range for this species. No individuals observed during biological surveys
Naturita milkvetch	<i>Astragalus naturitensis</i>	S2S3	Shallow pockets of soil on sandstone mesas, ledges, crevices and slopes in PJ woodlands (5000-7000 feet).	PA is in piñon-juniper habitat within the known elevational range for this species. No individuals observed during biological surveys

**Key:** S1-Critically Imperiled, S2-Imperiled, S3-Vulnerable, S4-Apparently Secure, B-Breeding population, Monument proclamation species.

**Source:** Colorado BLM State Directors' Sensitive Species List, BLM Information Bulletin No. CO-2000-14 (BLM 2000b) including CNHP-listed species (August 2006) and Canyons of the Ancients Monument Proclamation sensitive species (Kathy Nickell and Leslie Stewart, pers. comm.).

Although it is not BLM sensitive, the Mesa Verde nightsnake is mentioned as a “unique herpetological resource” in the Presidential Proclamation for the Monument. Hammerson (1999) mentions that this species is likely more common than is currently known, and that its habitat is not currently threatened. Mesa Verde nightsnake typically prefers rocky slopes and canyons, habitat components which are absent from the potential well pad sites (Hammerson 1999). Therefore it is not discussed further in this document.

The Colorado Division of Wildlife (CDOW) maintains a list of threatened and endangered wildlife species. No state-listed species have the potential to occur in the proposed project area.

Of the BLM listed sensitive flora species considered in this EA, limited potential habitat exists for one species; Naturita milkvetch (*Astragalus naturitensis*). On January 20, 2009, marginal potential habitat for Naturita milkvetch was observed generally along a 20 to 30 foot band on the canyon rim outside of the proposed boundaries for twinned GP #22 and 23 on the southern edge of the site. Kinder Morgan indicated at a November 2008 field visit that they would leave a buffer along the rim for visual screening at this site; therefore, potential Naturita milkvetch habitat identified in the area would fall outside of the planned disturbance footprint. A field visit on May 12, 2009, confirmed no habitat for Jones’ bluestar within the project area.

#### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative there would be no impacts to BLM sensitive species.

#### **Environmental Consequences – Alternative 2 (Proposed Action) and Alternative 3**

The proposed project area provides potential habitat for six BLM sensitive bat species, which may utilize the project area vicinity for foraging/roosting habitat. Under Alternatives 2 and 3, no potential roost sites would be directly impacted by project construction and potential indirect impacts to these species would include noise and human disturbance associated with well construction and operation, which could impact adjacent roosting habitat. Foraging bats may also be impacted by disturbance since activities at the well pad sites would be constant, day and night. These impacts are expected to be low and short-term during construction activities.

Clearing three well pads may actually provide additional foraging opportunities for raptors, particularly after the sites have been re-vegetated following interim reclamation and can provide some cover habitat for birds and small mammals. Raptors may be directly impacted by increased noise and human presence during construction, but this would be a low, short-term impact. No impacts to BLM sensitive plants would occur since none are present within the construction areas.

Under Alternative 2, impacts to sensitive species would be low and short-term (6 months or less) during construction and drilling operations, and low and long-term as a result of development and operation of the wells. The long-term impacts during operation of the wells and production lines would occur from periodic human activity, vehicular traffic in the area, and from the conversion of habitat to industrial use. However, there would be reduced access to the area by the general public since the access road would be gated, potentially resulting in less disturbance to BLM sensitive species from human disturbance. While there may be low impacts to individual

sensitive species located within the proposed project area, Alternative 2 would not lead to a trend toward listing these species.

### **Environmental Consequences-Alternative 3**

Impacts to BLM sensitive species would be virtually the same as those described for Alternative 2.

### **Mitigation Measures**

Construction activities for all of the well sites would be confined to the proposed well pad, associated access road, and production line routes to avoid potential impacts to sensitive species. No timing stipulations are recommended. Kinder Morgan would contact BLM resource specialists immediately if any BLM sensitive species were identified during construction or operation of the proposed project.

### **Cumulative Impacts**

Most disturbance to BLM sensitive species habitat in the project area has occurred in the past four decades: chaining occurred in the 1970's, the access road was built in 1978, and the old plugged and abandoned well at twinned site GP #22 and 23 was shut-in in the 1980s and the site was reclaimed. Grazing impacted the woodland understory which may have affected potential habitat for sensitive plant species or destroyed individuals. No other new oil, gas or CO<sub>2</sub> wells are projected for the Burro Point Mesa within the next five years. Therefore, any cumulative contribution would be low.

#### **8.3.13 Vegetation**

The Burro Point area is comprised of primarily piñon-juniper woodland habitat type. This section of the Monument was chained and seeded by the BLM for range enhancement in the mid 1960s, and slash piles, stumps, and large woody debris are still visible throughout the proposed project area and vicinity. One well pad, the proposed twinned GP #22 and 23, occurs within a previously disturbed area where a well (Woods Unit 32-37-18 #6) was drilled by Shell and subsequently plugged in the 1980s. The area was re-vegetated and is characterized by fourwing saltbush (*Atriplex canescens*), yucca (*Yucca sp.*), rubber rabbitbrush (*Chrysothamnus nauseosus*), prickly pear cactus (*Opuntia polyacantha*), antelope bitterbrush (*Purshia tridentata*), and mountain mahogany (*Cercocarpus montanus*). The two other proposed twinned well sites (GP #20 and 21 and GP #24 and #25) occur within a re-growth of early to mid-seral piñon-juniper woodlands approximately 40 years old. The woodlands are relatively dense (approximately 250 to 350 trees per well pad) and are dominated by Utah juniper (*Juniperus osteosperma*) and piñon pine (*Pinus edulis*). They contain a mean tree height of 6 to 9 feet and an estimated canopy cover of 15 to 35%. Understory shrub species include big sagebrush (*Artemisia tridentata*), rubber rabbitbrush, broom snakeweed (*Gutierrezia sarothrae*), cliff-rose (*Purshia stansburiana*), Mormon tea (*Ephedra viridis*), serviceberry (*Amelanchier utahensis*), Gambel oak (*Quercus gambelii*), antelope bitterbrush, and yucca. Understory shrub cover is less than 20%. Herbaceous ground cover is approximately 5 to 15%; and, at the time of the field surveys (December 5, 2006, and November 14, 2008), ground cover was composed primarily of toadflax penstemon (*Penstemon linarioides*), mountain pepperweed (*Lepidium montanum*), scarlet gilia (*Gilia aggregata*),

groundsel (*Packera multilobata*), slender buckwheat (*Eriogonum microthecum*), crested wheatgrass (*Agropyron cristatum*), Indian ricegrass (*Achnatherum hymenoides*), galleta (*Pleuraphis jamesii*) and cheatgrass (*Bromus tectorum*). Because the field survey was conducted outside of the normal growing season for many herbaceous plant species, there are likely other species that inhabit the project area.

From the eastern portion of the access road, the production line would be located in an existing utility line corridor to the compressor station. Vegetation on this production line consists primarily of shrubs (sagebrush, rabbitbrush, and snakeweed) and a variety of grasses.

The vegetation in the proposed project area and vicinity were qualitatively evaluated for overall health and productivity for the Standard for Public Land Health plant communities (BLM 2009). The project area and vicinity were determined to not meet the standard, primarily due to the lack of diversity of the expected structural and functional groups of species and the lower-than-expected annual productivity, presence of invasive plants, lack of litter, reduced reproductive capability, indications of plant mortality, and lack of cover and diversity of biological crust communities.

### **Environmental Consequences – Alternative 1 (No Action)**

Under the No Action Alternative, there would be no impacts to vegetation from the project.

### **Environmental Consequences – Alternative 2 (Proposed Action)**

Alternative 2 would result in the removal of 27.6 acres of vegetation for construction, primarily piñon-juniper trees and associated woodland species. The long-term vegetation loss would be 19.4 acres. This impact would be moderate and long-term, as regeneration of trees in disturbed areas may take 30 to 50 years to establish dominance. Disturbed areas would also be at risk for establishment of invasive or noxious plant species, which would displace and/or prevent establishment of native species. These impacts would be low to moderate and long-term, shifting to low and long-term as unused portions of the well pads and the production lines are reclaimed. Impacts to vegetation would be moderate and short-term during construction and drilling operations, and low to moderate and long-term after interim reclamation.

### **Environmental Consequences – Alternative 3**

Alternative 3 would result in the removal of 28.1 acres of vegetation during construction, primarily piñon-juniper trees and associated woodland species. This impact would be the same as described above for Alternative 2, with a slightly higher (2%) amount of vegetation removal.

### **Mitigation**

Per the project COAs Plan, Kinder Morgan would be responsible for interim reclamation of unused portions of the well pads and production line routes, including spreading the large woody material removed during drilling, reseeding with a BLM-approved seed mix (Table 6), conducting noxious weed management for the duration of the operation and reclamation activities, and conducting final reclamation after the project is completed. Project-specific mitigation measures for vegetation include the requirement that Kinder Morgan monitor the project area for a minimum of 3 years after construction to detect the presence of

noxious/invasive species. Noxious weeds would be controlled using materials and methods approved in advance by the BLM.

## **Cumulative Impacts**

Vegetation clearing has occurred in the project area related to well drilling (Woods Unit 32-37-18 #6), access road building, and pipeline construction. Vegetation has also been altered by the introduction and spread of noxious weeds due to ground-disturbing activities. The understory has been altered by past grazing activities. Weed monitoring and treatment for this project would reduce the spread of noxious weeds, and re-seeding would promote the re-growth of native vegetation. The current proposed project would result in additional vegetation clearing of approximately 27.6 acres, a low contribution to cumulative vegetation impacts. . Implementation of the Proposed Action, in conjunction with other past and reasonably foreseeable activities within the Area of Influence for the Proposed Action, would not cause noticeable changes in vegetation patterns or any loss of species diversity.

### **8.3.14 Visual Resources**

The general project area is currently dominated in the foreground and middle ground by dark-green piñon-juniper and lighter sage-green desert scrub with broad, level mesa tablelands intersected by numerous deep draws and steep canyons. Sleeping Ute Mountain dominates the background view to the south; the Abajo Mountains dominate the background view to the west, the La Plata Mountains lie to the east, and the edge of Monument Valley is faintly visible to the southwest. Uniformly colored agricultural fields and rectangular farm buildings interspersed with piñon-juniper and widely scattered light-colored well pads are frequently visible in the far foreground to the north. Two CO<sub>2</sub> compressor stations (tan and dark green), existing dirt roadways and pipeline cuts, and a 115-kV powerline are visible to the east and south from many portions of the project area.

Existing visual conditions along County Road N on the mesa top in the vicinity of proposed recompletion well pad Sand Canyon #6 and the southern flow line route include a Level 4 gravel road, a 115-kV overhead transmission line, and a reclaimed linear pipeline ROW with vegetation modifications located immediately adjacent to the road. Existing visual conditions in the vicinity of proposed wells GP #20 through 25 and the northern flow line are predominantly natural. Deviations from natural conditions in this area include occasional range fencing, the narrow existing two-track roadway, and a reclaimed well pad at the road's terminus at the western end of the mesa at the proposed location of GP #24 and 25.

The proposed project area is located approximately 3 miles to the west of the Goodman Point Outstanding Scenic Area (BLM 1985) (OSA), and approximately 18 miles from the Mesa Verde Rim OSA.

The San Juan/San Miguel RMP, which is the BLM's management document for the project area, states on page 26 that BLM would "establish site-specific visual quality objectives and design guidelines for landscape development projects during activity planning" (BLM 1991). Site-specific objectives are developed through a Visual Resource Inventory (VRI). A general inventory was completed in 2005 by the BLM for the Monument (BLM 2005b). The results of this inventory classified the proposed project area as VRM Inventory Class II (BLM 2005b).



Under Visual Resource Management (VRM) Class II objectives, change is limited to relatively low levels; activities may be visible but should not attract attention and should retain the existing character of the landscape (BLM 2007a).

The proposed project lies within Scenic Quality Rating Units (SQRU) 2, 3, and 4 as indicated in the July 2007 Scenic Quality Classification mapping of the Monument (BLM 2007b). SQRU 2 and 4 have been given SQRU ratings of “B+”; SQRU 3 has been previously rated as “A” by the BLM. The viewer Sensitivity Level Rating for the area is rated as “High” (based on Congressional designation of the Monument and local interest). Viewers are primarily recreational users who are concerned about and have an expectation for high scenic quality. Existing visitation in the proposed project area is low and would likely continue to be low into the next decade.

To establish existing scenic conditions, evaluate potential impacts of the proposed activities on sensitive view shed locations within the Monument, and assist the BLM with developing site-specific visual quality objectives, inventory classes, and design guidelines for the Proposed Action, a visual resource inventory and visual contrast rating study and view shed analysis was completed for the project vicinity. The results of this study are detailed in a Visual Resources Assessment Report (Ecosphere 2009) which has been filed separately with the BLM and is available at the Dolores Public Lands Office. The results of the study and BLM’s VRM inventory are summarized in Table 9.

Critical view locations for this project include: the un-maintained dirt two-track road (north fork of County Road N) with access to GP #20 to #25, the south fork of County Road N (a Level 4 gravel road and access to the proposed recompletion well site SC6), and sensitive viewpoints as identified in Table 9. The proposed project area can be viewed in all distance zones (foreground, middle ground, and background) from numerous locations.

As part of the visual impact assessment, 17 Key Observation Point (KOP) locations were developed through consultation with the BLM and were visited during the onsite inspection surveys. Eight of these 17 locations were identified as having representative views of the Proposed Action area. Visual contrast rating sheets and Visual Resource Inventory forms were completed for these 8 KOPs and are provided in the Report and summarized in Table 9. The data collected was used to confirm existing visual inventory classes for the areas associated with the KOP sites. Visual inventory classes do not establish management direction and only provide information to help consider visual values. Final approval for visual inventory classes in the project area would be coordinated by the BLM.

Based on the results of the analysis, the existing Visual Inventory Class II conditions identified by the BLM for the area were confirmed for the mesa top in the vicinity of the proposed well pads, and flow line and production line construction corridors. Visual resource inventory classes are defined in a manner similar to VRM classes, with Class II allowing minimal changes to the landscape, with management activities seen but not attracting the attention of the casual observer. Class III allows change to be moderate, with management activities potentially attracting the observer’s attention but not dominating it.

**Table 9. Summary of visual resource inventory class analysis.**

Location	Distance Zone/ Duration of Visibility/ Observer Position	Scenic Quality Rating Unit (SCRU)	Current/ Proposed SCRU Rating <sup>1</sup>	Sensitivity Level Rating <sup>2</sup>	Visual Resource Inventory Class (Existing/ Proposed) <sup>3</sup>	Visual Contrast Rating Results/ Anticipated VRI Classes <sup>4</sup>
<b>KOP 1 – Moqui Lake</b>	Foreground/ middleground  Approximately 1-2 minutes  Car on access road	2	18/B+  14/B	High	II/II	Recompletion well pad and production line construction corridor clearing would be visible in foreground from KOP and roadway, changing vegetative texture, color and lines, and dominating view.  VRI Class IV objectives met in short-term; effects mitigated thru neckdowns and uneven edge effects on construction corridor and pad.  VRI Class II objectives are expected to be met in long-term as reclaimed vegetation matures and returns to pre-construction levels
<b>KOP 3 – Big Point Dispersed Camping</b>	Foreground/ middleground  Variable; over 5 minutes; over 5 minutes  Standing at campsite	4	17/B+  15/B	High	II/II	Vertical lines of drill rigs and lights temporarily visible for several months in middleground from KOP. Well pads and flow line and production line corridor clearing would not be visible due to topographic and vegetative screening.  VRI Class III objectives would be met in the short-term during drilling (several months).  After completion of drilling, project would not be visible and VRI Class II objectives would be met.
<b>KOP 5- County Rd U Rock Climbing Site</b>	Foreground/ middleground  Variable; over 5 minutes  Standing on rim	2	18/B+  19/A	High	II/II	Vertical lines and lighting of drill rigs would be temporarily visible for several months in distant middleground. Well pad and construction corridor clearing may attract attention in distant middleground, though it would not dominate the landscape.  VRI Class III objectives would be met in short-term until drilling is completed. VRI Class II objectives would be met in long-term as reclaimed vegetation matures and returns to pre-construction levels.
<b>KOP 12 – County Road U</b>	Foreground/ middleground  Approximately 2-5 minutes	2	18/B+  18/B	High	II/II	Vertical lines and lighting of drill rigs would be temporarily visible for several months in distant middleground. Well pad and construction corridor clearing may attract attention in distant middleground, though it would not dominate the landscape.  VRI Class III objectives would be met in short-term until drilling is

Location	Distance Zone/ Duration of Visibility/ Observer Position	Scenic Quality Rating Unit (SCRU)	Current/ Proposed SCRU Rating <sup>1</sup>	Sensitivity Level Rating <sup>2</sup>	Visual Resource Inventory Class (Existing/ Proposed) <sup>3</sup>	Visual Contrast Rating Results/ Anticipated VRI Classes <sup>4</sup>
	Car on road					completed. VRI Class II objectives would be met in long-term as reclaimed vegetation matures and returns to pre-construction levels.
<b>KOP 13 – South Fork County Road N</b>	Middleground  Approximately 1-2 minutes  Car on road	2	18/B+  16/B	High	II/II	Vertical lines of drill rigs and lights temporarily visible for several months in middleground from KOP. Well pads and flow line and production line corridor clearing would not be visible due to topographic and vegetative screening.  VRI Class III objectives would be met in the short-term during drilling (several months).  After completion of drilling, project would not be visible and VRI Class II objectives would be met.
<b>KOP 14 – North Fork County Road N (between west and middle pad)</b>	Foreground/ middleground  Approximately 1-2 minutes  Car on road	2	18/B+  16/B	High	II/II	Flow line and access corridor clearing would occur immediately adjacent, changing vegetation line, texture, and color. Action would dominate view and be major focus. Drill rigs would be visible in the short-term.  VRI Class IV objectives would be met in short-term; effects would be mitigated through neckdowns and uneven edge effects on corridor.  VRI Class II objectives are expected to be met in long-term as reclaimed vegetation matures and returns to pre-construction levels.
<b>KOP 16 – North Fork County Road N at West Pad</b>	Foreground/ middleground  Approximately 1-2 minutes  Car on road	2	18/B+  16/B	High	II/II	Well pad and flow line and access corridor clearing would occur immediately adjacent, changing vegetation line, texture, and color. Action would dominate view and be major focus.  VRI Class III to IV objectives would be met in short-term; effects would be mitigated through neckdowns and uneven edge effects on construction corridors and pad.  VRI Class II objectives are expected to be met in long-term as reclaimed vegetation matures and returns to pre-construction levels.
<b>KOP 17 –</b>	Foreground/	2	18/B+	High	II/II	Flow line and access construction corridor clearing would occur

Location	Distance Zone/ Duration of Visibility/ Observer Position	Scenic Quality Rating Unit (SCRU)	Current/ Proposed SCRU Rating <sup>1</sup>	Sensitivity Level Rating <sup>2</sup>	Visual Resource Inventory Class (Existing/ Proposed) <sup>3</sup>	Visual Contrast Rating Results/ Anticipated VRI Classes <sup>4</sup>
<b>North Fork County Road N at intersection with access road to East Pad</b>	middleground  Approximately 1-2 minutes  Car on road		16/B			immediately adjacent, changing vegetation line, texture, and color. Action would dominate view and be major focus.  VRI Class III to IV objectives would be met in short-term; effects would be mitigated through neckdowns and uneven edge effects on construction corridors and pads.  VRI Class II objectives are expected to be met in long-term as reclaimed vegetation matures and returns to pre-construction levels.

Notes:

- 1 Scenic quality rating: A = 19 or more, B = 12-18, C = 11 or less. Agency ratings are for the entire Unit, and are not specific to the KOP point. Proposed ratings are for the specific KOP. Ecosphere's average rating for SQRU 2 is 15/B.
- 2 The entire Monument has been designated by the BLM as "High" sensitivity due to Congressional designation (Burns 2007)
- 3 VRI Class II = Change visible but does not attract attention; Class III = Change attracts attention but is not dominant; Class IV = Change is dominant but mitigated. Existing VRI classes = current BLM rating; Proposed VRI classes = classes identified during project-related analysis.
- 4 Visual contrast rating analysis considered proposed mitigation and applicant-committed design measures in determining the VRM classes that is expected to be achieved. Short term = 0-5 years, long-term = 6-20 years.

## **Environmental Consequences – Alternative 1 (No Action)**

Under Alternative 1 (the No Action Alternative), no impacts to project area visual resources would occur.

## **Environmental Consequences – Alternative 2 (Proposed Action)**

As part of the visual impact assessment study, a viewshed analysis was completed to determine areas in the Monument where the Proposed Action (Alternative 2) may be visible (see details of the study in the Visual Resources Assessment Report [Ecosphere 2009]). The viewshed analysis determined that proposed project well drilling and construction activities would be visible from approximately 18% or 29,500 acres of the approximately 166,000-acre Monument during the short-term of the drilling period. This number does not consider vegetative or atmospheric screening. Over the long-term (6 to 20 years), proposed well head and well pads would be visible from approximately 10% or 16,389 acres of the area within the Monument. Again, this number does not consider vegetative screening, which would substantially reduce this figure, or that producing CO<sub>2</sub> well heads are relatively compact and generally protrude no more than 6 feet above ground. These facilities would be present for the duration of the mineral development activities (approximately 10 to 20 years).

In many locations of the Monument, as described in mapping and KOP analysis included in the Visual Resources Assessment Report, the towers of drill rigs would be visible above the trees during well drilling, resulting in moderate, short-term impacts.

The visual quality of the land within the immediate vicinity (visual foreground) of the proposed well pad, access road, production line (if they are constructed), and flow line locations would be altered during the short-term by the Proposed Action. While the proposed three well pad sites (wells GP# 20 to #25) would be partially or fully screened by vegetation at a short distance from the sites, construction of the well pads, well access roads, and flow line and production line disturbance would dominate the foreground scenery in the short-term as viewed by travelers on the north and south forks of County Road N. These effects would primarily include disturbance at the recompletion well pad site, the 25-foot wide well pad access roads to GP# 20 through #25, and flow line and production line corridors that are buried. In the short-term, sections of the production line that are located on the surface would not contrast as distinctly with the surroundings as buried sections, particularly if the pipe surface is allowed to rust or is painted to blend in with the landscape. Even with implementation of successful design measures and the COA (Appendix A), the pad sites and linearly disturbed corridors would remain in distinct contrast to the adjacent piñon-juniper woodland in the short-term until reclamation vegetation begins to mature. The 132-foot tall drill rigs would also be temporarily visible at the pad sites for approximately 2 to 4 months at each location. As identified in the Visual Resources Assessment Report, the current Visual Resource Inventory Class II management objectives, as defined in the study, would not be met in the short-term (0 to 5 years) at the KOP locations indicated below due to the presence of drill rigs, flow line, and potential production line construction, or well pad construction:

- KOP 1: Moqui Lake (foreground zone)

- KOP 3: Big Point Dispersed Camping (middleground zone);
- KOP 5: County Road U Rock Climbing Site (middleground zone);
- KOP 12: County Road U (middleground zone);
- KOP 13: County Road N – South Fork (middleground zone);
- KOP 14: County Road N – North Fork (Between well sites #22 and #23 and #24 and #25) (foreground zone);
- KOP 16: County Road N – North Fork at West pad and well sites #22 and #23 (foreground zone); and
- KOP 17: County Road N – North Fork (East pad and well sites #20 and #21 access road intersection with County Road N) (foreground).

VRM Inventory Class II conditions would be met in the short-term at KOPs 3, 5, 12, and 13 following completion of well drilling when drill rigs are no longer visible. Project work, which may include production line construction if drilling is successful, would be occurring immediately adjacent to KOPs 14, 16 and 17, and would likely attract the attention of a casual observer in the short-term. It is anticipated that VRM Inventory Class II objectives would ultimately be met in the long-term (6 to 20 years) for KOP sites 1, 14, 16, and 17 if design criteria as outlined below and in the COA are implemented. Specific designs relating to the location of “neck down” areas, uneven edges on the construction corridors and well pads, and other site development planning are expected to be identified in the COA following a project decision from the BLM.

### **Environmental Consequences – Alternative 3**

Development of this alternative would result in generally the same types of effects to visual resources as those identified under Alternative 2 (Proposed Action); however, the extent of the effects would be increased. The construction of approximately 817 feet of buried production line in previously undisturbed terrain, including removal of vegetation, would result in a greater visual disturbance than Alternative 2 in the short-term. Implementation of the design criteria, specifically “feathering” vegetation along the edges of the corridor and leaving cut vegetation in the ROW, would help to reduce visual effects associated with this alternative. Following successful reclamation and re-establishment of vegetation along the production line route, VRM Inventory Class II conditions should be met in the area in the long-term.

### **Design Criteria and Mitigation**

Application of the following BMPs, which incorporate practices identified in the Surface Use Plans are expected to result, in addition to mitigation outlined in the COA (Appendix A) and summarized below, in the proposed project meeting VRM Inventory Class II objectives in all distance zones in the long-term (6 to 20 years) and in distant middle ground zones as viewed from the vicinity of KOPs 3, 5, 12, and 13 in the short-term (within 1 year or after drilling is completed). Potential impacts to visual resources would be minimized by the implementation of design criteria described below and adherence to Kinder Morgan’s Surface Use Plans should the APDs be approved.

## *General Design*

1. Areas disturbed by earth-moving operations and vegetative clearing, including well pads, flow line and production line construction corridors, and access roads, would have edge modification treatments implemented to create a varied organic, irregular shape along the linear aspects of the project and to increase the number of more “naturally” shaped openings. Specific locations for these treatments are expected to be identified in the final COA in coordination with the BLM. Locations should avoid known cultural sites. Work could be completed by hand (no ground disturbance) in sensitive locations to avoid effects to cultural sites and other resources. Slash from cut trees should be left in place, or stored outside the well pad perimeter and used for restoration of replanted/seeded areas.
2. The overall amount of ground disturbance would be limited to minimize impacts to visual resources. Access road and flow line and production line routes should be kept to the minimum width of the construction corridor necessary to complete the proposed project development activities and within previously disturbed areas co-located with proposed project activities. Pipeline routes should be installed immediately adjacent to existing roads (within existing ditch areas if possible) with trench spoil piles kept within 10 feet of the trench edges to allow for safe driving on the access roads while construction activities occur. The total area of disturbance for access roads and pipeline routes would be kept to the minimum width within the proposed construction area and existing ROW corridor.
3. During construction activities, the construction contractor would periodically “neck down” access road and pipeline construction corridor area widths. Representatives from the BLM and Kinder Morgan and/or Ecosphere should identify and flag neck down locations along each access road, pipeline construction corridor, and well pad prior to construction. Attempts should be made to disturb less than 15% of the construction corridor area to partially retain inventory class objectives. Necking down should involve leaving clumps of trees and shrubs that would provide visual buffers or breaks in ground disturbance. Buffer areas could be developed in locations where excavation activities could be performed from both sides of the “buffer” while keeping the “buffer” area free of spoil piles and vehicle access. The preservation of trees should not be done in a manner that would cause any equipment to be operated in an unsafe manner.
4. The existing roadway along the proposed northern flow line would be managed to prevent it from becoming a more developed travel route. This can be achieved partially by reclaiming the existing road to its original width after flow line and production line construction activities are completed.
5. All surface equipment, including pipe guards, and permanent structures (onsite for 6 months or longer) constructed or installed would be painted a flat, non-reflective earth-tone color, typically Yuma Green (5Y 3/1), that best matches the surrounding environment. Colors may be chosen based upon the most recent guidance provided by the BLM on their suggested environmental color chart, or as designated by the Rocky Mountain Regional Coordinating Committee (RMRCC), and the PANTONE Architecture and Interiors Color Guide - 2003.
6. Measures would be taken to control noxious weeds adjacent to disturbed areas throughout the course of operations (including production phase). Noxious weeds, which may be

introduced due to soil disturbance or reclamation, should be treated by methods to be approved by the Authorized Officer. These methods may include biological, mechanical, or chemical treatments. Should chemical or biological treatment be requested, Kinder Morgan would submit a Pesticide Use Proposal to the Authorized Officer 60 days prior to the planned application date.

### ***Project Reclamation***

1. Soil would not be scraped from the surface where topsoil stockpiles are to be placed. Suitable topsoil material should be conserved in stockpiles along the construction corridors, access roads, and at the well pads. Topsoil would be stripped to an average depth of 6 inches, stockpiled, and segregated from areas where subsoil materials are stored. Any stockpile not used within 6 months would be seeded to insure topsoil integrity and prevent erosion.
2. If production is established, unused portions of the well pad would be recontoured, topsoil spread, and reseeded per BLM requirements.
3. All disturbed areas would be recontoured to blend as closely as possible with the natural topography. This includes removing all berms and refilling all cuts.
4. Stockpiled topsoil would be spread evenly over the areas designated for restoration. Enough topsoil should be kept to reclaim at a later date the portion of the well pad and access road needed for production operations. This remaining topsoil stockpile would be seeded in place using prescribed seed mixtures as approved by the BLM.
5. Kinder Morgan (or contractor) would contact the BLM's Dolores Public Lands office (970-882-7296) at least 48 hours prior to starting reclamation work and upon completion of restoration measures.
6. Seed would be broadcast between September 1 and December 1 (prior to ground frost). Seed may be drilled at half the rate of broadcast seeding. Seed depth equals 0.5 inch. All seeding rates would be in pounds of pure live (adapted varieties) seed.
7. Reclamation would be considered successful when the desired vegetative species are re-established, erosion is controlled, weeds are considered a minimum threat, and it is likely that ground cover would return to its pre-disturbance condition. Revegetation efforts would continue until this standard is met. Monitoring of reclamation success would be conducted on a yearly basis until revegetation requirements are satisfied or as identified by the BLM.
8. Reclamation operations would start immediately after drilling or completion operations cease and should be completed as soon as weather conditions allow.
9. Interim reclamation of non-used portions of the well pad areas and the pipeline routes would be initiated as soon as possible after project construction activities are completed. Reclamation of areas adjacent to roads and construction corridor corridors should take priority and should be implemented at the completion of development activities. Interim and



final project reclamation activities should be completed in accordance with Surface Use Plan and COAs.

10. As part of short-term reclamation activities, cactus and yucca that could be destroyed during ground-clearing activities would be removed and stockpiled, using appropriate methodology as identified and approved by the BLM, prior to ground-clearing activities. The stockpiled plants would be re-planted (typically within 60 days) in areas that would be immediately reclaimed after well drilling activities are completed.
11. All disturbed areas would be re-contoured to blend as closely as possible with the natural topography. This should include removing all berms, refilling all cuts, and removing or re-contouring gravel well pads.

### ***Mitigation Measures***

The following mitigation measures (currently outlined in Appendix A, COAs), in addition to the previously mentioned Design Criteria committed to by the applicant, should result in the project meeting VRM Inventory Class II objectives within 6 to 20 years following implementation of reclamation.

1. Portions of the well pads deemed unnecessary for production would be shaped to conform to the natural terrain. Topsoil stockpiled during construction would be spread back over the recontoured areas. Portions of the access roads and pipeline routes deemed unnecessary for production would also be reseeded. The seed mixture shown in Table 6 would be used as a base for reclamation seeding. Native shrub and forb seeds, such as penstemon, fourwing saltbush, ephedra, fendlerbush, mountain mahogany, serviceberry, cliff rose, and desert bitterbrush, would also be considered for addition to the reclamation seed mix in appropriate locations as identified by the BLM. The seed would be distributed by drilling. If a drill cannot access the reclamation area, the seed would be broadcast. The woody materials stockpiled during construction are to be spread evenly back over the reclaimed and seeded areas. This organic debris would provide cover and stabilizing material for the soil, seed mix, and young plants.
2. If the seed is broadcast, application rates should be twice the drilled rate and a rake or harrow would be used to incorporate the seed into the soil. Certified weed-free mulch may be required on locations with an inadequate supply of removed vegetation.
3. The seed mixture used must be certified weed free. There would be no primary or secondary noxious weeds in the seed mixture. Seed labels from each bag would be available for inspection while seeding is being accomplished. The seeding contractor would keep a record of the dates seeding was accomplished for each site and should send that information along with the seed labels from each bag to the Dolores Public Lands Office (29211 Highway 184, Dolores, CO 81323). The Surface Managing Agency representative (Tom Rice or Cara MacMillan at 970-882-6845) should be notified 7 days prior to seeding so that they may be present to witness reseeding activities. If grasses and native vegetation are not established after the first seeding application, subsequent applications would be required until grasses and/or native vegetation are established.

4. The Permit Holder (Holder) would be responsible for control of all State-listed noxious weed species on all disturbed areas. The Holder is responsible for consultation with the Authorized Officer and local authorities for acceptable weed control methods.
5. Upon final reclamation, all compacted areas and areas devoid of vegetation on location would be ripped, along the contour, to a minimum of 6 inches in depth, unless located on solid rock, before the re-spread of topsoil and subsequent reseeding.
6. The following standards would be applied to determine the success of reclamation efforts. The operator would continue re-vegetation efforts, at the direction of BLM, until these standards are met. Reclamation would be considered successful when the desired vegetative species are established, erosion is controlled, weeds are considered a minimal threat, and it is likely that ground cover would return to a desirable condition. The following parameters should be used to determine the success of re-vegetation efforts.
  - a. Successful onsite establishment of species included in the planting mixture or other desirable species.
  - b. Evidence of vegetation reproduction, either spreading by rhizomatous species or seed production.
7. The period of liability under the bond of record would not be terminated until each well is inspected and the surface rehabilitation approved.
8. Aboveground flow line and production line piping would either be painted to match the surrounding landscape or be allowed to rust to blend in with the surroundings. Any vegetative removal needed for aboveground pipeline construction would be conducted in accordance with guidance previously identified for this project.

Project work would be occurring immediately adjacent to KOPs 1, 10A, and 11 and would likely attract the attention of a casual observer in the short-term. It is anticipated that VRM Inventory Class II objectives would ultimately be met in the long-term (6 to 20 years) for KOP sites 1, 10A, and 11 if design criteria as outlined below and in the COA are implemented. Specific designs relating to the location of “neck down” areas, uneven edges on the construction corridors and well pads, and other site development planning are expected to be identified in the COA following a project decision from the BLM. Currently, the only alternative being considered is the No Action Alternative. Under this alternative, no additional impacts to project area visual resources are anticipated.

### **Cumulative Impacts**

Existing disturbance has contributed to the current VRI Class II and III ratings for the majority of the project area. If design criteria previously specified for the proposed project is also adopted for future actions in the cumulative effects area, including recompletion of Sand Canyon #6 and development of a production line in an existing ROW, it is anticipated that the Proposed Action would not contribute towards a change in visual classes for the area.

### 8.3.15 Wildlife, Aquatic, and Terrestrial

No perennial water sources are located within the proposed project area or within a 1-mile radius of any project elements. The closest perennial water source is Yellow Jacket Creek, located approximately 1 mile to the north of the proposed project area. Therefore no aquatic wildlife species are present within the area of affect for the proposed project.

The proposed project area is located on the Burro Point area, which is primarily composed of piñon-juniper woodland habitat. This habitat type provides cover and forage for a wide range of terrestrial wildlife. In the fall, large flocks of pinyon jays feed on and cache piñon seeds, providing essential dispersal of these seeds. Several small mammals, including the piñon mouse (*Peromyscus truei*), which nests in hollow piñon trees, and the bushy-tailed woodrat (*Neotoma cinerea*), depend on piñon seeds for food. Some large mammals, including black bear (*Ursus americanus*), also utilize piñon seeds as a fall food source. Many mammal populations in the project area are influenced by the shrub and grass species present in the understory vegetation, including the long-tailed weasel (*Mustela frenata*), the coyote (*Canis latrans*), the red fox (*Vulpes vulpes*), the bobcat (*Lynx rufus*), mule deer (*Odocoileus hemionus*), the black-tailed jackrabbit (*Lepus californicus*), the desert cottontail (*Sylvilagus audubonii*), the rock squirrel (*Spermophilus variegates*), the least chipmunk (*Tamias minimus*), and the deer mouse (*Peromyscus maniculatus*) (BLM 2009). Bird species commonly found in piñon-juniper woodlands are described in Section 8.2.5.

Overall, the woodland vegetation found in the proposed project area is too young (i.e., the trees are too small) to serve as nest substrates for raptor species such as red-tailed hawk, northern goshawk (*Accipiter gentiles*), and great-horned owl (*Bubo virginianus*). The project area may provide foraging opportunities for smaller *Accipiter* species such as sharp-shinned hawk (*Accipiter striatus*) and Cooper's hawk (*Accipiter cooperii*), as well some smaller owl species such as northern saw-whet owl (*Aegolius acadiscus*).

The piñon-juniper/mixed shrub habitat within the project area is used by big game including mule deer and elk. Mule deer are year-round residents in the project area, and both deer and elk are known to occur as year-round residents in the Monument due to the proximity to developed agricultural fields (Nickell 2007). However, the project area is less used by elk, since it is mapped by CDOW as a "Limited Use Area," which means it is occasionally inhabited by elk and/or contains a small scattered population of elk (NDIS 2008).

#### **Environmental Consequences -- Alternative 1 (No Action)**

Under the No Action Alternative, there would be no impacts to wildlife from the project.

#### **Environmental Consequences – Alternative 2 (Proposed Action)**

Alternative 2 would remove a maximum of 27.6 acres of piñon-juniper woodland and sagebrush grassland habitat that could be utilized by a variety of wildlife. Vegetation removal would result in moderate, long-term habitat loss and fragmentation. During construction activities, there would be moderate, short-term impacts to area wildlife as a result of human and vehicular activity, and the associated noise. Wildlife would be temporarily displaced by construction activities, although after construction is complete, wildlife could return to the area. The access

road would be gated and closed to the public after project completion, which would decrease human disturbance from recreation in the project area in the long-term. The well sites are surrounded by large tracts of undisturbed similar habitat, so animals could move to these areas during construction.

The proposed project area provides forage for big game species, mostly mule deer and some elk, and would mean a loss of forage for these animals. Understory species such as mountain mahogany, antelope bitterbrush, and serviceberry that are found throughout the project area are an important food source for deer and elk. Mule deer and elk may also be affected by a temporary increase in vehicle traffic during construction, resulting in a temporary disruption of foraging, displacement of big game from and around disturbed areas, and possibly some mortality from vehicle collisions. On a small-scale, literature has shown that ungulates predictably avoid areas during active exploration and drilling, moving to denser cover and areas farther from human activity (Hebblewhite 2008). Disturbance may result in increased energy expenditure by big game animals. While individual deer and elk may be impacted by Alternative 2, population-level impacts to big game herds are not expected.

Vegetation removal would result in a loss of habitat for a variety of shrub and tree-nesting birds protected under the MBTA. These impacts are described in detail in Section 8.2.5. Under Alternative 2, potential impacts to area wildlife would be low and short-term during construction and drilling, shifting to low and long-term during the production phase.

### **Environmental Consequences – Alternative 3**

Alternative 3 would result in the loss of 28.1 acres of primarily piñon-juniper habitat. This impact would be the same as described above for Alternative 2, with a slightly higher amount of habitat loss.

### **Design Criteria**

Design Criteria for the Proposed Action include the stipulation that construction activities would be confined to the proposed well pads, access road, and production lines to minimize disruption to wildlife. Because the project does not occur in winter range for mule deer and elk mapped by CDOW, no annual timing limitation would be applied to the proposed project activities.

### **Cumulative Impacts**

The removal of 27.6 acres of wildlife habitat would contribute to the habitat fragmentation that exists throughout the area from existing roads, production lines, and well pads. However, based on the amount of adjacent undisturbed terrain, habitat fragmentation is not prevalent in the project area. Also, travel on the Burro Point access road would be restricted to traffic associated with the new well-sites, reducing the chances of wildlife collisions with recreational vehicles. Therefore, the project would not contribute towards a measurable cumulative impact on wildlife.

## **9.0 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS**

### **9.1 Interrelation to Other Projects**

The proposed project area is located within the Paradox Basin, a broad area of sustained development by oil and gas producers, located in Colorado on the west side of Montezuma and Dolores counties. The area encompassed by the proposed project, as well as adjacent areas, has been affected by oil and gas development since the early 1950s. Exploration and development of existing oil and gas leases on BLM administered lands within the Monument and in Montezuma County continues today. Developed resources include production of natural gas, crude oil, and CO<sub>2</sub> gas. Past, present, and future potential exploration activities include wildcat drilling and seismic exploration.

According to the 1985 San Juan/San Miguel Planning Area RMP and the 1991 Oil and Gas Amendment (BLM 1991 p. 4-30) for the San Juan/San Miguel Planning Area, approximately 2% (1,430 acres) of the surface area within the management area would be impacted by oil and gas activities by 2011. That considers the potential drilling of 313 wells with an average surface disturbance of 4.0 acres per well (BLM 1991 pp. B-2 and B-49). The total disturbance for the Proposed Action is approximately 28 acres, which represents 0.04% of the land area within the Monument. The BLM prepared a RFD document for oil, natural gas, and CO<sub>2</sub> development within the Monument in April 2005 (BLM 2005a). The RFD document states that 185 wells have been drilled within the Monument since the 1940s (p. 1), with an additional 150 wells estimated to be drilled in the next 20 years. Of these wells, 69 of the proposed new wells would be CO<sub>2</sub> wells (p. 1). Kinder Morgan's six proposed wells would be within the number of wells estimated in the RFD document. Additional discussion of past, present and reasonably foreseeable actions can be found in the Cumulative Effects section in 8.3.3.

### **9.2 Unavoidable Adverse Impacts**

There would be 19.4 acres of long-term disturbance and 8.2 acres of short-term disturbance associated with the development of the Proposed Action. Unavoidable adverse impacts to soils, vegetation, recreation resources (due to implementation of controlled access), and wildlife would be long term. The removal of 27.6 acres of wildlife habitat would contribute to existing habitat fragmentation associated with existing roads, pipelines, and well pads. The impacts to wildlife would be a trade off with improvements to wildlife habitat associated with controlled access and reducing the number of visitors and off road travel within the project area.

Short term unavoidable adverse environmental impacts would include impacts to visual resources, local air resources and noise levels during well drilling and construction activities; i.e., dust created by vehicular travel on unpaved roads and exhaust from rig and vehicle operation. These impacts are expected to be short-term and of low impact.

Specific management criteria that may be monitored to insure regulatory compliance and to evaluate cumulative impacts of the Proposed Action include:

- Air quality monitoring by the National Park Service at Mesa Verde National Park;

- Water quality monitoring by the CDPHE and the BLM at McElmo Creek gauging stations;
- Ongoing range land health assessments performed on the Burro Point Community grazing allotment;
- Invasive species monitoring and management within the area of disturbance;
- Periodic compliance inspections of the proposed project area by BLM Natural Resources staff to insure compliance with Surface Use COAs, and other environmental compliance; and
- Bi-weekly Storm Water Management Plan inspections to insure National Pollutant Discharge Elimination System (NPDES) compliance during project construction and interim reclamation/permit operation period.

## **10.0 RESIDUAL IMPACTS**

### **10.1 Irreversible Commitments**

Irreversible commitments are those that generally cannot be reversed, such as the extinction of a species or the extraction of a mineral. If the Proposed Action is approved and the wells are determined to be productive, the CO<sub>2</sub> gas would be extracted. The CO<sub>2</sub> generated from the project would be transported to out-of-state markets for utilization in tertiary oil recovery projects. Because the CO<sub>2</sub> would not be expected to regenerate, the extraction of the CO<sub>2</sub> would be an irreversible commitment.

### **10.2 Irretrievable Commitments**

If the proposed wells, pipelines, and access roads are approved, approximately 19 acres of long-term disturbance would remain after interim reclamation activities have been completed. The 19 acres of disturbance would be unavailable for forage production, vegetation, and wildlife habitat for the length of the proposed project (estimated 10 to 20 years) and therefore be irretrievable for as long as the development remains. The 19 acres would remain in use by Kinder Morgan until the CO<sub>2</sub> wells are deemed unproductive. At that time, the wells would be properly plugged and abandoned per BLM and COGCC requirements, and final reclamation would be performed. Final reclamation would restore the areas of disturbance to natural, pre-disturbance conditions and retrieve the 19 acres. In some cases, final reclamation has resulted in restoring sites to conditions that are an improvement over site conditions that existed before disturbance. This has been primarily due to weed treatments and seeding with native grasses.

## **11.0 CONSULTATIONS**

Individuals and agencies listed in Table 10 have been consulted in the preparation and review of this Environmental Assessment:

**Table 10. Individuals consulted and area of responsibility.**

Name	Office/Agency	Title
Tom Rice	DPLO - BLM	Natural Resource Specialist Oil and Gas
Eric La Price	DPLO - BLM/USFS	Biological Scientist/NEPA Coordinator/Project Manager
Mike Jensen	DPLO - BLM/USFS	Rangeland Management Specialist
Kathy Nickell	DPLO - BLM/USFS	Wildlife Biologist
Shauna Jensen	DPLO - BLM/USFS	Hydrologist
Leslie Stewart	DPLO - BLM/USFS (retired)	Ecologist
Jennifer Burns	DPLO - BLM/USFS	Landscape Architect
LouAnn Jacobson	BLM - Monument	Monument Manager/Authorized Officer
Linda Farnsworth	BLM - Monument	Archaeologist
Kevin Joseph	DPLO – BLM (retired)	Fire Management Officer
Cara MacMillan	DPLO-BLM/USFS	Ecologist
Paul Morey	DPLO-BLM/USFS	Wildlife Biologist
Bob Clayton	Kinder Morgan	Construction Supervisor

The following organizations and individuals were contacted and/or consulted during preparation of this document.

- U.S. Fish and Wildlife Service regarding listed flora and fauna;
- Colorado National Heritage Program regarding Montezuma County species of concern;
- BLM State Director’s Office - List of BLM Sensitive Species;
- Native American Tribes included in the tribal consultation;
- Norman Utley, Utley Construction; and
- Jerry Fetterman, Woods Canyon Archaeological Consultants.

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**APPENDIX A**  
**BLM SURFACE USE CONDITIONS OF APPROVAL**

DRAFT FINAL

# **Surface Use Conditions of Approval**

**Kinder Morgan CO<sub>2</sub> Company, LP (Kinder Morgan)  
Goodman Point Development Project  
Canyons on the Ancients National Monument  
Montezuma County, Colorado**

The following Conditions of Approval (COA) take precedence over any or all terms and conditions set forth in the Applications for Permits to Drill (APD) Surface Use Plan. Kinder Morgan and its contractors should refer to these COAs and the Surface Use Plan for specific information associated with construction, drilling, production, and reclamation.

The COA are presented below by type of onsite activity expected for the Kinder Morgan Goodman Point Development Project.

## **Special Conditions of Approval**

1. A copy of these Conditions of Approval and the operators Surface Use Plan must be on location at all times.

## **Conditions of Approval**

### **General Cultural Resource Protection Conditions of Approval:**

1. Before beginning work, it is the responsibility of the operator to inform all employees, contractors, and subcontractors of applicable cultural resource laws and regulations; as well as the project-specific measures for protecting cultural resources. Disturbance to, defacement of, or collection or removal of archaeological, historical, or sacred material is prohibited by law. Disclosure or release of information regarding the nature and location of archaeological, historic, or sacred sites, without written approval by the Bureau of Land Management (BLM) is prohibited by law.
2. Disclosure or release of information regarding the nature and location of archaeological, historic, or sacred sites, without written approval by the BLM, is prohibited under provisions of the Archaeological Resources Protection Act. Cultural resource and other permittees of the BLM are allowed to use this information during the course of the project for site protection purposes only. Unauthorized use or distribution of this information (which includes site location information present in cultural resource reports) is a violation of Federal statute.
3. If cultural resources or human remains, funerary items, sacred objects, or objects of cultural patrimony are discovered during construction, activity in the vicinity of the resource will cease, the resource will be protected, and the Canyons of the Ancients National Monument Archaeologist at 970-882-5614, will be notified immediately and the following procedures will be carried out. Should cultural resources be discovered during construction, activity in the vicinity of the resource will cease, the resource will be

protected, and the Monument Archaeologist at 970-882-5614, will be notified immediately. The operator shall take any measures requested by the BLM to protect the resources until they can be evaluated and treated. The discovered resources will be documented and evaluated by a permitted archaeologist. The permitted archaeologist, in consultation with the BLM archaeologist, will make a determination of the nature and significance of the discovery, and will determine the appropriate method of treatment for it. Avoidance is the preferable treatment. However, if the resources cannot be avoided, the appropriate treatment method will be determined, and the permitted archaeologist will prepare any and all necessary treatment plans. These plans will be reviewed and approved by the BLM. Treatment activities will be conducted after all necessary consultations have been completed as required by Section 106 of the National Historic Preservation Act, the Native American Graves Protection and Repatriation Act, and the Archaeological Resources Protection Act. The BLM will be responsible for conducting all necessary consultations. Construction within the area of the discovery will be allowed to proceed after the appropriate treatment has been completed.

4. Pursuant to 43 CFR 10.4, the holder of this authorization must notify the Monument Archaeologist at 970-882-5614, by telephone, with written confirmation, immediately upon the discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. The operator must stop activities in the vicinity of the discovery and protect it until notified to proceed by the authorized BLM officer.

#### **Cultural Resource Protection and Monitoring Conditions of Approval:**

5. Temporary fences will be erected, either by or under the direction of a permitted archaeologist, adjacent to the cultural resource sites specified in Table 6-2 of *A Cultural Resources Clearance of the Proposed Kinder Morgan Goodman Point Development Project* (Honeycutt and Fetterman 2009:13) prior to the start of construction activities.
6. Sites determined “eligible” or “need data” located 10 meters (30 feet) or less from construction would have temporary barrier fences erected at the edge of the authorized construction area nearest to the site boundary. Site monitoring would be completed a minimum of three times during implementation: 1) during initial ground disturbance, 2) periodically during active work, and 3) a final check after construction is completed. Monitoring results will be submitted in writing upon completion of each phase (initial, periodic, and final).
7. Sites determined as “not eligible” for the NRHP located 10 meters or less from construction would be monitored once during initial ground disturbance. Monitoring results will be submitted in writing upon completion of each phase (initial, periodic, and final).
8. Cultural resource monitors would assure that construction activities are confined within fenced and flagged areas. No equipment or construction would be allowed beyond the fence anytime during construction or subsequent well operations.

9. All soil removal operations and trenching for the well pads, pipelines, and building of access roads would be monitored by a permitted archaeologist for subsurface cultural resources.
10. For construction of the proposed pipeline and main access road through site 5MT6940: Vegetation would be cleared by hand for the pipeline ROW. The existing road and the pipeline ROW, located 5 feet east of the existing road, would be covered with geo-textile fabric to protect cultural deposits below the existing road and in the pipeline ROW. A 12-inch thick bed of gravel would be placed on top of the fabric. All pipeline construction would occur above the geo-textile fabric and gravel. The pipeline would be placed on concrete thrust blocks and suspended aboveground. To protect the site, periodic inspection of the thrust blocks would be conducted to insure that the blocks remain on top of the gravel.
11. All work, staging, and parking of equipment will be confined to the approved areas specified in the EA.
12. The access road at the entrance to the Burro Point project area will be gated and locked to minimize vehicular access to cultural areas and to prevent further OHV impacts and vandalism.

**To minimize visual impacts to the cultural landscape:**

13. Portions of the well pads deemed unnecessary for production shall be shaped to conform to the natural terrain. Topsoil stockpiled during construction should be spread back over the recontoured areas. Portions of the access roads and pipeline routes deemed unnecessary for production should also be reseeded. Native vegetation would be re-established throughout the disturbed area, leaving only a small teardrop for access to the wellhead during operations (see Reclamation COAs).
14. Upon termination of all operations, native vegetation would be re-established in all remaining disturbance (see Reclamation COAs).
15. Vegetation removal would be designed to maximize screening of disturbed areas viewed from cultural resource sites to the development and from the development to cultural resource sites. Use of irregular vegetation removal patterns would help retain a natural appearance (see Construction COAs).

**To address Tribal Recommendations:**

As stated in the EA:

16. The existing road will be upgraded to accommodate development activities.
17. The road and pipeline ROW will be limited to 25 feet.

18. The CO<sub>2</sub> pipeline will be laid on the surface in areas where subsurface cultural resources are likely to be present.
19. Work areas will be hydromowed [instead of bladed] to limit ground disturbance and minimize reclamation needs.
20. 1,100' of the existing main access road that cuts through two sites would be re-routed to avoid the sites. The abandoned road section would be reclaimed using non-disturbing techniques, such as spreading brush on the surface and hand seeding.
21. The existing disturbed area will be used for two well locations (GP 22 and GP 23).
22. Horizontal drilling will be used to minimize the number of well locations requiring new disturbance.
23. Cultural resource monitors will be present during surface-disturbing activities.
24. Cut trees will be provided as firewood for Pueblo use.
25. A post-construction field visit will be conducted with tribal representatives.

### **Construction and Drilling**

1. The operator or his contractor will contact the Monument Manager, at the Anasazi Heritage Center in Dolores, Colorado, seven (7) days before beginning any surface-disturbing activities and before beginning any reclamation.
  - Tom Rice (970) 882-6845 or
  - LouAnn Jacobson (970) 882-5600
2. The operator will assure that all project-related vehicle traffic is limited to the bladed/traveled road surface. No pullouts or off-road parking will be allowed unless specifically authorized. "Keep vehicles on the road surface" signs must be installed by the operator to assist with compliance as needed. No shortcutting by any motor vehicles operated by employees or contractors is permitted on roads not identified as access routes in the APD. Vehicular access to the pad will be strictly limited to authorized vehicles only; these vehicles are restricted to use on the drill pad only; no off-pad or off-road parking.
3. Surface-disturbing activities will not be conducted during extended wet periods or when vehicles and/or construction equipment will leave excessive ruts and damage to roads associated with the Project. If vehicles and/or construction equipment create surface ruts in excess of 4 inches in depth, for a length of at least 10 feet, soil conditions are too wet to adequately support construction equipment. Construction activities will not be allowed until soil conditions improve.



4. If vegetation clearing activities are to occur within the migratory bird breeding season (April through August), then a nest inventory will be performed prior to clearing vegetation. If active nests are found, vegetation removal will be postponed until after the nest either successfully fledges young or fails.
5. Vegetation removal would be designed to maximize screening of disturbed areas viewed from cultural resource sites to the development and from the development to cultural resource sites. Use of irregular vegetation removal patterns would help retain a natural appearance.
6. The proposed access road designs will be prepared by a registered engineer and the design plans will be submitted to the BLM for review and approval prior to initiation of road construction activities.
7. The access roads and well pads will be adequately surfaced and shall be wetted down and compacted where needed to avoid dust and loss of soil. If production is achieved, a minimum of 18-inch culverts will be placed in the permanent road as needed and will be installed as outlined in the oil and gas "Gold Book" to reduce erosion per San Juan/San Miguel Resource Area policy. Culverts shall be designed for the 50-year event or be at least 18 inches in diameter with energy dissipaters downstream. BLM may require additional culverts, if erosion or road damage is not well-controlled by initial construction.
8. All brush, limbs, crushed stumps, and other woody material will be stockpiled separately from the topsoil just outside the well pad perimeter, within the construction zone buffer. The stripped vegetation and 6 inches of topsoil shall be stockpiled separately just outside the well pad perimeter. The stripped vegetation shall not be removed from the location (it will be used later for reclamation). If the topsoil stockpile is not used within 6 months, it will be seeded to insure topsoil integrity and prevent erosion.
9. The reserve pits will be sealed to prevent leakage of the fluids with a 12-mil or thicker plastic liner. The bottom of the pit shall be smooth and free of any sharp rocks. If any of the pits has a rocky bottom, it shall be bedded with a geotextile material to avoid the possibility of puncturing the liner. A minimum of not less than a 2-foot freeboard will be maintained in the pit at all times. All oil or floating debris will be removed from the pit immediately after the drilling phase of the well.
10. During the drilling phase of the program, a perimeter fence will be placed around each of the reserve pits. They shall be fenced on three (3) sides and built in such a manner as to prohibit entry of wildlife. The fences shall be constructed with "woven wire." Measures should also be taken to prohibit avian species from entering the pit area (e.g., bird netting). The fourth side of the pit area will be fenced immediately upon removal of the drilling rig, and the fencing will be maintained until all pits are backfilled. In the event that one pit is closed prior to the other, the perimeter fence will then be placed around the remaining opened pit until such time as it is backfilled. At no given time shall any open pits be unfenced.

11. Prior to rigging up, storm water controls will be placed around the perimeter of the well pad and any natural moisture will be diverted off of the pad and away from the location. In addition, ditches will be dug around all equipment onsite and any fluids from machinery will be diverted into the reserve pit in the case of a spill. The well pad would be designed in such a manner as not to allow runoff water to enter the pad. Drainages from the berm shall be armored and have an apron at the discharge end to disperse the water. A lined sump pit may be utilized to contain such fluids.
12. Heavy equipment will be pressure-washed at an offsite location prior to entering the site. This is a preventive measure for reducing noxious weed infestation at the drilling sites. If equipment is moved directly from site to site while on this Project, then pressure washing between sites is not required. However, if equipment is removed from a site, used elsewhere, then brought back to the project area, pressure washing is required before the equipment can be used in the project area. This pertains to heavy equipment such as bulldozers, backhoes, etc. Pickup trucks and passenger vehicles do not require pressure washing prior to entering these sites.
13. The integrity of any fence and associated cattle guard must not be compromised during the construction, production, or reclamation phase of the project. All cattle guards, gates, and fence brace panels should be well constructed and regularly maintained. Toxins, such as ethylene glycol, should be kept off the ground where livestock can reach them. The operator is responsible for noting these problems in the field and correcting them before the function of fences/cattle guards/gates is comprised. Once notified by the BLM that a problem exists and that the BLM attributes it to the operator's activities, the operator has 24 hours to correct fence/cattle guard/gate problems resulting from their activities.
14. Water withdrawals from surface waters require notification to the State of Colorado by the company and the water rights holder if using a private water right that is not decreed for industrial use. Colorado requests notification two weeks prior to the beginning of surface waters withdrawals to determine if there is a call on or below the withdrawal point. Regardless of when or how fresh water is used, the State of Colorado will be notified and allowed to respond before water is withdrawn from any surface waters in Colorado. The contact office for Southwestern Colorado is the Division of Water Resources in Durango, Colorado (970-247-1845), and for the Water Commissioner for the Dolores River is (970) 565-0694. After the drilling operations are completed a final estimate of the volume of water used for all activities should be submitted in writing to the State of Colorado. If required by the state of Colorado, the operator must apply and obtain water rights prior to water withdrawals.
15. For any well pad locations with any slope across the pad area, an "eyebrow ditch" shall be installed above the locations on the up-hill side. The intent of the eyebrow ditch is to intercept surface water flows, and disperse the water to either side of the location. The ends of the ditch, or "daylight" ends should be placed in native soils, within undisturbed areas.
16. Well pad and pipeline clearing activities will be completed in a manner to minimize 'linear' construction as much as possible. To achieve this goal the edges of the

construction areas should 'varied' or 'rounded' to provide less of a linear shape. In addition, selected locations along the pipeline routes should have clumps or individual trees preserved within the route, to provide a visual break from the linear clearing. The preservation of trees should not be done in a manner that would cause any equipment to be operated in an unsafe manner.

17. The reserve pit will be sealed to prevent leakage of the fluids with a 12 mil or thicker plastic liner to protect surface-water and ground-water quality. Methods available to insure containment of drilling fluids in the reserve pit include lining the inside of the pit with at least 12 mil plastic. The bottom of the pit shall be smooth and free of any sharp rocks. If the pit has a rocky bottom, it shall be bedded with a material such as soil, sand, straw or hay to avoid the possibility of puncturing the liner. A minimum of not less than a 2-foot freeboard will be maintained in the pit at all times. All oil or floating debris will be removed from the pit immediately after the drilling phase or the well. The pit will be placed in cut material.
18. No fill will be placed in ephemeral drainages.

## **Production**

1. All permanent structures (onsite for 6 months or longer) constructed or installed as part of the development, will be painted with a flat, non-reflective, earth-tone color which will be **Yuma Green** (5Y 3/1) from the list of 10 standard environmental colors designated by the Rocky Mountain Regional Coordinating Committee (RMRCC), and the PANTONE Architecture and Interiors Color Guide, 2003.
2. All production equipment located within the Monument shall be equipped with hospital type mufflers. Regardless of whether the operation is at the construction, drilling, or production phase, if the BLM determines that noise has become a nuisance, additional muffling techniques will be applied to achieve adequate noise reduction and acceptable noise levels.
3. Noxious weeds which may be introduced due to soil disturbance or reclamation will be treated by methods approved by the Authorized Officer. These methods may include biological, mechanical or chemical treatments. Should chemical or biological treatment be requested, the operator must submit a Pesticide Use Proposal to the Authorized Officer 60 days prior to the planned application date (see Reclamation COA #7).
4. The access roads shall be maintained reasonably smooth, and free of ruts in excess of 3-4 inches, soft spots, chuckholes, rocks, slides and washboards. The BLM, San Juan Resource Area road specifications, professional engineer prepared design standards and "Gold Book" shall be followed for specifications on road design and culvert installation. All weather surfacing will be required if well becomes a producer. A regular maintenance program shall include blading, ditching, sign replacement, surfacing, and culvert maintenance. The operator is required to correct maintenance deficiencies when documented and directed by the Authorized Officer. All vehicles servicing the well are restricted to use of the approved access road and well pad.

5. Accidental spills will be cleaned up immediately, and contaminated soils will be removed to a permitted disposal site. BLM spill reporting procedures will be followed.
6. Each reserve pit and that portion of the location and access road not needed for production or production facilities will be reclaimed as described in the reclamation section.
7. Compaction and construction of the berms surrounding the tank or tank batteries (if utilized) will be designed to prevent lateral movement of fluids through the utilized materials, prior to storage of fluids. The berms must be constructed to contain at a minimum 120% of the storage capacity of the largest tank within the berm.

All load lines and valves shall be placed inside the berm.

8. No gravel or other related minerals from new or existing pits on Federal land will be used in construction of roads, well sites, etc., without prior approval from the Surface Managing Agency.

### **Reclamation**

1. Immediately upon completion of each well, all trash and debris will be collected from the location and the surrounding area and removed to an approved sanitary landfill.
2. Portions of the well pads deemed unnecessary for production shall be shaped to conform to the natural terrain. Topsoil stockpiled during construction should be spread back over the recontoured areas. Portions of the access roads and pipeline routes deemed unnecessary for production should also be reseeded, leaving only a small teardrop for access to the wellhead during operations.
3. The seed mixture shown in the table below shall be used. The seed should be distributed by drilling where possible, and broadcasting if a drill cannot access the reclamation area. The woody materials stockpiled during construction are to be spread evenly back over the reclaimed and seeded areas (see COA #7 below).
4. As part of short-term reclamation activities, plant material that would be destroyed during ground clearing activities (cacti and yucca) should be removed and stockpiled prior to ground clearing activities. The stockpiled plant material should be re-planted in areas that would be immediately reclaimed after well drilling activities are completed.

**Table A-1 -- Seed Mix – Piñon-Juniper Area.**

Kinder Morgan Burro Point Seed Mix			Drilled rate		Broadcast rate	
Common Name	Species Name	Variety	Pounds/acre	Pure live seed/ft <sup>2</sup>	Pounds/acre	Pure live seed/ft <sup>2</sup>
Indian ricegrass	Achnatherum hymenoides	Rimrock	6.2	20	11.7	38
Squirrel tail	Elymus elymoides	Bottlebrush	1.1	5	2.2	10
Blue grama	Chondrosium gracile	Alma	0.3	5	0.5	10
Mutton grass	Poa fendleriana	VNS	0.4	10	0.8	19
Needle and Thread	Hesperostipa comata	VNS	1.9	5	3.6	10
Galleta	Hilaria jamesii	Viva, florets	1.4	5	2.6	10
<b>Total</b>			<b>11.3</b>	<b>50</b>	<b>21.4</b>	<b>95</b>

If the seed is broadcast, application rates will be twice the drilled rate and some means such as a rake or harrow will be used to incorporate the seed into the soil. Certified weed-free mulch may be required on locations with an inadequate supply of removed vegetation.

The seed mixture used must be *certified* weed free. There shall be NO primary or secondary noxious weeds in the seed mixture. Seed labels from each bag shall be available for inspection while seeding is being accomplished. **The seeding contractor shall keep a record of the dates seeding was accomplished for each site and shall send that information along with the seed labels from each bag to Cara MacMillan at the Dolores Public Lands Office (29211 Highway 184, Dolores, CO 81323).**

In the event grasses and native vegetation are not established after the first seeding application, subsequent applications will be required until grasses and/or native vegetation are established, as per the standards shown in Reclamation COA #9 below.

Native shrub seeds (penstemon, fourwing saltbush, ephedra, mountain mahogany, serviceberry, cliff rose, fendlerbush, and desert bitterbrush) may be added to the reclamation seed mix as identified above in appropriate locations as identified by the BLM and in coordination with Kinder Morgan.

5. Notify Surface Managing Agency representative (Tom Rice at 970-882-6845) seven (7) days prior to seeding so that they may be present to witness reseeding activities.
6. Upon final reclamation, all compacted areas and areas devoid of vegetation on location shall be ripped, along the contour, to a minimum of 6 inches in depth before the re-spread of topsoil and subsequent reseeding.
7. Upon final reclamation, all access roads will be shaped to conform to the natural terrain and left as rough as possible to deter vehicle travel. Access will be ripped, along the contour when possible, to a minimum depth of 6 inches, water barred and reseeded. All erosion problems created by the development must be corrected prior to acceptance of release. Water bars should be spaced as shown below along the fall line of the slope:

**Table A-2 – Water Bar Spacing Interval**

<b>Slope (%)</b>	<b>Spacing Interval (feet)</b>
Less than 2 %	200
2 to 4 %	100
4 to 5 %	75
5 to 10 %	50
10 to 15 %	30

8. The brush, limbs, crushed stumps and other woody material stockpiled during construction, if any, should be spread back over reclaimed areas and associated pipelines after seeding. This organic debris will provide cover and stabilizing material for the soil, seed mix, and young plants.
9. The Permit Holder (Holder) shall be responsible for control of all State listed noxious weed species on all disturbed areas. The Holder is responsible for consultation with the Authorized Officer and local authorities for acceptable weed control methods, and shall comply with the following:
  - a) Use of pesticides shall comply with all applicable Federal and State laws. Pesticides shall be used only in accordance with their registered uses within limitations imposed by the Secretary of the Interior. Prior to the use of pesticides, the Holder shall obtain approval from the Authorized Officer of a Pesticide Use Proposal showing the type and quantity of material to be used, pests to be controlled, method of application, locations of storage and disposal of containers, and any other information deemed necessary by the Authorized Officer.
  - b) All pesticide applicators must hold a valid Colorado Qualified Supervisor license or Certified Operator license, and the license must be valid for the applicable pesticide application category. **For all areas treated, Pesticide Application Records (BLM Form 3-3-94) must be submitted to the BLM Dolores Field Office by November 1 of each year.** Pesticide Application Records must be completed no later than 14 days following the pesticide application and must be maintained for ten years.
10. The following standards will be applied to determine the success of reclamation efforts. Reclamation should be considered successful when the desired vegetative species are established, erosion is controlled, weeds are considered a minimal threat, and it is likely that ground cover will return to a desirable condition. The following parameters should be used to determine the success of re-vegetation efforts.
  - a) Successful onsite establishment of species included in the planting mixture or other desirable species.
  - b) Evidence of vegetation reproduction, either spreading by rhizomatous species or seed production

The operator should continue re-vegetation efforts, at the direction of BLM, until these standards are met.

11. The period of liability under the bond of record will not be terminated until each well is inspected and the surface rehabilitation approved.
12. A fence shall be installed around the perimeter of the area undergoing reclamation. The fence shall be maintained in a manner to prevent cattle from entering the area, and shall be constructed as follows: Posts to be no more than 16' apart; fence wire: four wires of at least 12.5 gauge, double strand twisted; two stays between posts; wire stretched taut between brace panels, wire spacing from the ground up: 14", 22", 30", 42". The fence shall be maintained in place for a minimum of 3 years, and will be removed by the Operator when so instructed by BLM.
13. All reserve pit fluids must be removed or evaporated from the pit before starting reclamation procedures. Enhanced evaporation of the reserve pit fluids shall have prior approval of the Monument Manager. The liner shall be cut off at the mud level and removed to an approved disposal site. The reserve pit must be reclaimed within 12 months (but no later than the following August 31) from the date the well is spudded. The reserve pit solids will not be squeezed out of pit, however the solids may be mixed with stockpiled materials as the pit is reclaimed. Mixing stockpiled materials and reserve pit solids can facilitate drying the reserve pit solids (by mixing damp solids with dry dirt), aid in compaction of materials in the pit, prevent subsequent settling of the pit, and shorten the time needed for the reserve pit reclamation. The pit liner will not be cut during mixing of damp solids with dry dirt. There will be a minimum of 2 feet of overburden on the pit prior to replacing the topsoil and seeding.

**APPENDIX B**  
**BLM - FISH AND WILDLIFE CLEARANCE LETTER**  
**PLANT AND WILDLIFE LIST**

DRAFT FINAL



# FISH AND WILDLIFE CLEARANCE REPORT

PROJECT NAME: Kinder Morgan Goodman Point Development Project

**Table 1. Survey Results.**

X	Field surveys were completed on 24 October 2006, 5 December 2006, 30 January 2007, 7 March 2007, 14 November 2008, 20 January 2009, and 12 May 2009 by <b>Ecosphere Environmental Services.</b>		
	No field survey is required.		
	A field survey is needed, but cannot be completed by required date due to:		
	Inappropriate season	Inadequate lead time	Higher priorities

SPECIES CONSIDERED

**Table 2. Federally Listed Species for Proposed Action, in Montezuma County, Colorado.**

Species	Status	Habitat Present In Project Area?	Species Affected?
Canada lynx	Threatened	No	No
Mexican spotted owl	Threatened	No	No
Southwestern willow flycatcher	Endangered	No	No
Yellow-billed cuckoo	Candidate	No	No
Bonytail	Endangered	No	No
Colorado pikeminnow	Endangered	No	No
Humpback chub	Endangered	No	No
Razorback sucker	Endangered	No	No
Uncompahgre fritillary butterfly	Endangered	No	No
Mesa Verde cactus	Threatened	No	No
Mancos milkvetch	Endangered	No	No
Sleeping Ute milkvetch	Candidate	No	No
Knowlton's cactus	Endangered	No	No
Pagosa gilia	Candidate	No	No

**Table 3. Colorado Bureau of Land Management Sensitive Fish, Plant, and Wildlife Species Based on Information Bulletin No. CO-2000-14 (April 2000) for San Juan Public Lands.**

<b>Species</b>	<b>Habitat Present In Project Area?</b>	<b>Species Impacted?</b>
Allen's big-eared bat	<b>Yes (foraging only)</b>	<b>Possible</b>
Big free-tailed bat	<b>Yes (foraging and roosting)</b>	<b>Possible</b>
Fringed myotis	<b>Yes (foraging only)</b>	<b>Possible</b>
Spotted bat	<b>Yes (foraging and roosting )</b>	<b>Possible</b>
Townsend's big-eared bat	<b>Yes (foraging only)</b>	<b>Possible</b>
Yuma myotis	<b>Yes (foraging only)</b>	<b>Possible</b>
Bald eagle	<b>No</b>	<b>NA</b>
Black tern	<b>No</b>	<b>NA</b>
Ferruginous hawk	<b>No</b>	<b>NA</b>
Gunnison sage grouse	<b>No</b>	<b>NA</b>
Northern goshawk	<b>No</b>	<b>NA</b>
Peregrine falcon	<b>Yes (foraging only)</b>	<b>Possible</b>
White-faced ibis	<b>No</b>	<b>NA</b>
Bluehead sucker	<b>No</b>	<b>NA</b>
Colorado River cutthroat trout	<b>No</b>	<b>NA</b>
Flannelmouth sucker	<b>No</b>	<b>NA</b>
Roundtail chub	<b>No</b>	<b>NA</b>
Longnose leopard lizard	<b>Marginal</b>	<b>NA</b>
Desert spiny lizard	<b>No</b>	<b>NA</b>
Jones' blue star	<b>Marginal</b>	<b>NA</b>
Cronquist milkvetch	<b>No</b>	<b>NA</b>
Naturita milkvetch	<b>Yes</b>	<b>NA</b>
Ripley milkvetch	<b>No</b>	<b>NA</b>
Sandstone milkvetch	<b>No</b>	<b>NA</b>
<i>Carex scirpoidia</i>	<b>No</b>	<b>NA</b>
Little green sedge	<b>No</b>	<b>NA</b>
Fragile rockbreak	<b>No</b>	<b>NA</b>
Giant helleborine	<b>No</b>	<b>NA</b>
Kachina daisy	<b>No</b>	<b>NA</b>
Comb Wash buckwheat	<b>No</b>	<b>NA</b>
Pagosa bladderpod	<b>No</b>	<b>NA</b>
Dolores River skeleton plant	<b>No</b>	<b>NA</b>
Eastwood monkey-flower	<b>No</b>	<b>NA</b>
Aromatic Indian breadroot	<b>No</b>	<b>NA</b>
<i>Salix candida</i>	<b>No</b>	<b>NA</b>

## **DISCUSSION:**

This project does not conflict with RMP guidelines.

Potential habitat for longnose leopard lizards exists in the vicinity of the project area although site characteristics of the well pads limit the potential for occurrence. The lizard occurs in piñon/juniper habitat on the Monument. In one study conducted in the Monument in Montezuma County, Colorado, longnose leopard lizards on Cannonball Mesa utilized habitats that had expanses of low forb and grass cover with low-to-medium cover of shrubs and trees (Schorr and Lambert 2006). Specifically, their habitat consists of medium cover of one-seeded juniper and Mormon tea, but with little grass cover. A site assessment on 14 November 2008 revealed that two of the twinned well sites (GP #20 & 21 and GP #24 & 25) consisted of dense woodland habitat with moderate grass cover, unsuitable for long-nosed leopard lizards. No longnose leopard lizards were identified during the onsite visits to the proposed project. The twinned well pad GP #22 & 23 is located in a previously disturbed site which was denuded of piñon and juniper trees, and therefore, also does not contain suitable habitat for the lizard. Therefore, no impacts to this species are expected.

Foraging habitat exists for the six sensitive bat species. Because the project would not require the removal of any potential roosts, impacts to these species are expected to be low. It is expected that bats currently utilizing project area habitat would disperse into similar available habitat surrounding the project area.

Because potential nest sites exist within the vicinity of the project area (about 1 mile away), peregrine falcons may utilize project area habitat for foraging. Potential foraging, however, is limited by the dense woodland throughout most of the project area. A raptor survey was conducted on 30 January, and no potential nest sites were identified within 1.0 mile of the project area. The rocky cliffs of Yellow Jacket Canyon, located approximately 1 mile north of the proposed project area, provide suitable nesting and perching sites for peregrine falcon and golden eagle. There are no known nest locations for peregrine falcon or golden eagle within 1 mile of the project area (Nickell 2007); however, these species are known to utilize the Monument for hunting. A historic peregrine falcon eyrie is located on Sleeping Ute Mountain, approximately five miles south of the project area (BLM 1986). A telemetry study in Colorado determined that peregrine falcons may use a home range during nesting of 358 to 1508 square kilometers (222 to 935 square miles) (Enderson and Craig 1997). Hunting flights within these home ranges ranged from 12 to 26 miles from the eyrie. Therefore, peregrines may use the project area for hunting.

Some potential for Naturita milkvetch and Jones' bluestar occurrence exists in the project area. However, because the project area does not contain exposed sandstone ledges or draws, important habitat components for these plants, potential for occurrence is low. One ephemeral drainage was identified in the northwest corner of twinned GP #20 & 21. This drainage contained sparse upland vegetation and marginal habitat for Jones' bluestar. No suitable habitat for the Naturita milkvetch was identified within the twinned GP #20 & 21 footprint, and Ecosphere surveyed this site in May 2009 and confirmed that no Jones' bluestar populations occurred. No potential habitat for either the milkvetch or the bluestar was identified at twinned GP #24 & 25. The site lacks the rock outcrops often seen where Naturita milkvetch grows and lacks ephemeral drainages, typically associated with bluestar habitat. No individual Naturita

milkvetch or Jones' bluestar were identified during the field examinations. Since none were identified, it is not expected that project construction would impact either of these species.

**MITIGATION MEASURES**

No mitigation measures for threatened, endangered or sensitive species have been identified for this project.

**CONCLUSIONS**

**Threatened and Endangered Species**

<b>X</b>	There are no federally listed or proposed species known to occur within the project area.
	The Proposed Action would have no effect on the following federally listed or proposed species:
	The Proposed Action would have <b>no effect on designated or proposed critical habitat</b> for the following species:
	The Proposed Action <b>may affect but is not likely to adversely affect</b> the following federally listed species and their habitats. <i>Effects are expected to be beneficial, insignificant (unmeasurable), or discountable (extremely unlikely).</i>
	The Proposed Action <b>may affect and is likely to adversely affect</b> the following federally listed species and their habitats. <i>Effects are expected to be adverse or detrimental.</i>

**BLM Sensitive Species**

	The Proposed Action would have <b>no impact</b> on any of the sensitive species listed in Table 3.
	The Proposed Action would have a <b>beneficial impact</b> on the following sensitive species: <b>None</b>
<b>X</b>	The Proposed Action <b>may adversely impact individuals but is not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range wide</b> on the following sensitive species: <b>peregrine falcon, Allen's big-eared bat, Big free-tailed bat, Fringed myotis, spotted bat, Townsend's big-eared bat, Yuma myotis, Naturita milkvetch and Jones' bluestar</b>

	The Proposed Action <b>may adversely impact individuals and is likely to result in a loss of viability on the planning area, in a trend to federal listing, or in a loss of species viability rangewide</b> on the following sensitive species: <b>None</b>
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*A Biological Evaluation is not required for BLM sensitive species; this Clearance Form completes the assessment of these species.*

SPECIALIST Aimee E. Way Date: December 9, 2009

Aimee Way, Biologist  
Ecosphere Environmental Services

DRAFT FINAL

**PLANTS OCCURRING IN THE  
KINDER MORGAN CO<sub>2</sub> GAS WELL  
PROJECT AREAS**

**Forbs**

*Sisymbrium altissimum*  
*Packera multilobata*  
*Erodium cicutarium*  
*Ipomopsis aggregata*  
*Eriogonum microthecum*  
*Descurainia pinnata*  
*Lepidium montanum*  
*Penstemon linarioides*  
*Portulaca oleracea*  
*Physaria acutifolia*

Tumblemustard  
Groundsel  
Filaree  
Skyrocket gilia  
Slender buckwheat  
Tansy mustard  
Mountain pepperweed  
Toadflax penstemon  
Little hogweed  
Sharpleaf twinpod

**Grasses**

*Achnatherum hymenoides*  
*Agropyron cristatum*  
*Bromus tectorum*  
*Pleuraphis jamesii*

Indian ricegrass  
Crested wheat grass  
Cheatgrass  
Galleta

**Shrubs**

*Amelanchier utahensis*  
*Artemisia tridentata*  
*Quercus gambelii*  
*Chrysothamnus nauseosus.*  
*Gutierrezia sarothrae*  
*Ephedra viridis*  
*Purshia stansburiana*  
*Cercocarpus montanus*  
*Purshia tridentata*  
*Yucca sp.*  
*Atriplex canescens*

Serviceberry  
Big sagebrush  
Gambel oak  
Rubber rabbitbrush  
Broom snakeweed  
Mormon Tea  
Cliff-rose  
Mountain mahogany  
Antelope bitterbrush  
Yucca  
Fourwing saltbush

**Cacti**

*Opuntia polyacantha*

Prickly pear cactus

**Trees**

*Juniperus osteosperma*  
*Pinus edulis*

Utah juniper  
Piñon pine

**COMMON WILDLIFE WITH POTENTIAL TO OCCUR IN THE  
KINDER MORGAN CO<sub>2</sub> GAS WELL  
PROJECT AREAS**

**Mammals**

<i>Canis latrans</i>	Coyote
<i>Cervus elaphus</i>	American elk
<i>Cynomys gunnisoni</i>	Gunnison's prairie dog
<i>Dipodomys spectabilis</i>	Bannertail kangaroo rat
<i>Erethizon dorsatum</i>	Porcupine
<i>Lepus californicus</i>	Black-tailed jackrabbit
<i>Mephitis mephitis</i>	Striped skunk
<i>Odocoileus hemionus</i>	Mule deer
<i>Sylvilagus auduboni</i>	Desert cottontail
<i>Ursus americanus</i>	Bear
<i>Vulpes vulpes</i>	Red fox

**Birds**

<i>Apelocoma coerulescens</i>	Scrub jay
<i>Buteo jamaicensis</i>	Red-tailed hawk
<i>Carpodacus mexicanus</i>	House finch
<i>Cathartes aura</i>	Turkey vulture
<i>Chordeiles minor</i>	Common nighthawk
<i>Colaptes auratus</i>	Northern flicker
<i>Corvus corax</i>	Common raven
<i>Eremophila alpestris</i>	Horned lark
<i>Euphagus cyanocephalus</i>	Brewer's blackbird
<i>Falco spawerius</i>	American kestrel
<i>Gymnorhinus cyanocephalus</i>	Pinyon jay
<i>Pica pica</i>	Black-billed magpie
<i>Sialia mexicana</i>	Western bluebird
<i>Sturnella neglecta</i>	Western meadowlark
<i>Turdus migratorius</i>	Robin

**Reptiles**

<i>Crotalus viridis</i>	Prairie rattlesnake
<i>Pituophis melanoleucus</i>	Bull snake
<i>Sceloporus stansburiana</i>	Side-blotched lizard
<i>Sceloporus graciosus</i>	Sagebrush lizard

**APPENDIX C**  
**BLM – TRIBAL CONSULTATION**

DRAFT FINAL



## BLM – TRIBAL CONSULTATION

**July 2, 2007:** Initial letter from the BLM to the tribes listed below notifying them of the proposal, providing them with the cultural inventory information/BLM “adverse effect” determination, and initiating consultation for the undertaking.

**Acoma, Pueblo of**  
**Cochiti, Pueblo of**  
**Hopi Tribe**  
**Isleta, Pueblo of**  
**Jemez, Pueblo of**  
**Jicarilla Apache Nation**  
**Laguna, Pueblo of**  
**Nambe, Pueblo of**  
**Navajo Nation**  
**Northern Ute Tribe**  
**Picuris, Pueblo of**  
**Pojoaque, Pueblo of**  
**San Felipe, Pueblo of**  
**San Ildefonso, Pueblo of**  
**San Juan, Pueblo of**  
**Sandia, Pueblo of**  
**Santa Ana, Pueblo of**  
**Santa Clara, Pueblo of**  
**Santo Domingo, Pueblo of**  
**Southern Ute Indian Tribe**  
**Taos, Pueblo of**  
**Tesuque, Pueblo of**  
**Ute Mountain Ute Tribe**  
**Zia, Pueblo of**  
**Zuni Pueblo**

**July 16, 2007:** Response from **Pueblo of Laguna** stating that “The Pueblo of Laguna has determined that the proposed undertaking will not have a significant impact at this time.” Laguna would like to be notified if new sites discovered and any artifacts recovered to review items.

**July 16, 2007:** Response from the **Hopi Tribe** stating that Hopi claim cultural affiliation to the prehistoric culture groups in the Canyons of the Ancients National Monument. Do not concur with the recommended determination of “no effect” on eligible historic properties contained in the inventory report. Hopi determine “adverse effect.” Ask BLM to make appointment to attend an administrative meeting with the staff of the Hopi Cultural Preservation Office to discuss their opposition to the project.

A review of tribal responses to Environmental Assessments conducted for Monument projects in the past 2 years was conducted by the Monument archaeologist. This review determined that the **Hopi, Laguna, Acoma, and Zia** have actively participated at least once during this period. No

documented responses were received from the remainder of the tribes during this period. It was determined on the basis of these results to focus follow-up efforts on **Hopi, Acoma, and Zia.**

### **Follow up with The Hopi Tribe**

**July 6 and 10, 2007:** Telephone follow-up with **Hopi** Cultural Preservation Office; left message requesting to set up a meeting regarding this project.

**July 13, 2007:** Spoke to Leland Dennis. He scheduled BLM for the July 18, 2007 administrative meeting at 1:00 p.m. Monument Manager not available; called back and cancelled.

**July 23 & 26, Aug. 7, 2007:** Left messages with Terry Morgart acknowledging receipt of letter, and calling to schedule an administrative meeting as requested.

**August 9, 2007:** Terry Morgart left message asking if we could meet on August 22. Farnsworth returned call, left message that we can make an 8/22 meeting, let me know what time and where.

**August 13, 2007:** Spoke to Terry Morgart. Appointment for August 22, 2:30 p.m. at the Hopi Dept. of Natural Resources building conference room.

**August 22, 2007:** Administrative meeting with **Hopi** Cultural Preservation Office Director, Leigh Kuwanwiswma, and Terry Morgart, Legal Researcher. Morgart criticized and disagreed with the determination of effect of “no historic properties effected” recommended by Woods Canyon Archaeological Consultants in the report.

They expressed a concern that some features contained in sites may be culturally significant to the Hopi (and not recognized by non-Hopi during inventory). Especially in sites recommended as not eligible. Stated a need to know what future development plans are in order to properly assess cumulative effects. They inquired as to why the monument manager was willing to allow a smaller buffer than the standard state-wide 100 meters. The Manager stated that she is trying to work with the operator. The Hopi representatives stated that legislation should be initiated in order to modify the proclamation for the monument to exclude further oil and gas development within the monument in order to protect the cultural landscape.

Their final recommendation was to schedule a field visit for members of the Hopi Cultural Resources Advisory Task Team to assess certain sites and features within the context of Hopi traditional knowledge.

**September 6, 2007:** Telephone conversation between Terry Morgart, **Hopi** Cultural Preservation Office and Linda Farnsworth. Terry stated that they will assert that an EIS is necessary for this proposal, he will send a letter stating this. They feel that this proposal is the place to draw the line on this scope of development in the monument. He asked for the portions of the monument proclamation that address the purpose of, and protection of the objects- specifically in regard to oil and gas development.

**September 16, 2007:** Letter from **Hopi** Cultural Preservation Office

- Asserts the Hopi claim of cultural affiliation to prehistoric groups in the Canyons of the Ancients National Monument , and supports the identification and avoidance of prehistoric archaeological sites and traditional cultural places.
- Cites the contradiction of potential energy development within the National Monument and within BLM special area designations (Mockingbird Mesa Cultural Resource Emphasis Area and the Anasazi Cultural Multiple Use Area of Critical Environmental Concern).
- States that the Hopi do not concur with the survey report recommendation that “The building of the project will have no effect on eligible cultural resources...”
- States the concern with the small avoidance buffers between site boundaries and construction areas.
- Asserts that the Hopi conclude that the proposal will result in significant adverse effects to numerous cultural resources significant to the Hopi Tribe; and that an Environmental Impact Statement and Hopi Ethnographic and Traditional Cultural Property Study are necessary to evaluate whether this proposal will create new impacts that interfere with the proper care and management of the objects protected by the Proclamation.
- Requests monument to schedule a preliminary site visit by the Cultural Resource Advisory Team members.

**September 18, 2007:** Telephone call from Linda Farnsworth to Terry Morgart, **Hopi** CPO. Left a message

- Thanking Terry for their response letter and asking him to call to schedule a field visit.
- Informing Terry that we would proceed with 106 for the proposal with an “adverse effect” determination of effect and the Environmental Assessment process to determine if an EIS is necessary.

**September 28, 2007:** Letter to **Hopi** updating them on how their input was considered and incorporated into project determination of effect and how 106 consultations and EA would move forward.

**Follow-up with the Pueblo of Acoma**

**July 6, 13, and Aug. 8, 2007:** Left messages for Theresa Pasqual, Director, **Acoma** Historic Preservation Department, stating that following up to our letter about the project, offering to schedule a meeting if they would like to get more detailed information, or a field visit.

**August 9, 2007:** Spoke to Theresa Pasqual. She did not recall seeing our letter and the report, not sure if it had made it over from the Governor’s office yet. She said that she would track it down and look it over. She stated that she is concerned about the small buffer. She will call if she

can't find it, and will ask BLM to send another copy. She said she will get back to us about a meeting.

**August 15, 2007:** Follow-up letter referenced the July 2, 2007 letter and information about the project. Requested input on the project determination of effect, traditional cultural property identifications, and offered to meet with them, or provide additional information if desired.

**September 18, 2007:** Letter to Theresa Pasqual, **Acoma**, reiterating the BLM contact efforts regarding this proposal, and stating that no input had been received, therefore, consultation would be concluded. Stated that Acoma will be provided an EA for review.

### **Follow-up with the Pueblo of Zia**

**August 8, 9, 14, 2007:** Left messages with Celestino Gachupin, Manager, **Zia** Natural Resources Department, following up to our letter about the project, offering to schedule a meeting if they would like to get more detailed information, or a field visit.

**August 14, 2007:** Called the **Zia** tribal office to see if Gachupin is still in position of Manager of Natural Resources Department. Offices closed for feast days 8/14-16. Re-open Aug. 17.

**August 20, 2007:** Called the **Zia** tribal office to see if Gachupin still Manager of Natural Resources department. Determined that he is. Called his number and left a message to call me in reference to the project, and requested input that Zia may have.

**August 15, 2007:** Follow-up letter referenced the July 2, 2007 letter and information about the project. Requested input on the project determination of effect, traditional cultural property identifications, and offered to meet with them, or provide additional information if desired.

**September 18, 2007:** Telephone message from Peter Pino, Tribal Administrator, **Zia Pueblo** to LouAnn Jacobson, Monument Manager. She returned his call. He said that he had been contacted by Kinder Morgan about the project and that the Zia had no concerns about the project. He will send a letter stating this. No letter received.

### **Follow-up with the Navajo Nation**

**Oct. 15, 2007:** Letter of response from the **Navajo Nation** stating that the project will not impact any Navajo traditional cultural properties or historical properties. Requests notification if inadvertent discoveries made during the course of the project.

### **Kinder Morgan Goodman Point Project Environmental Assessment (EA) Tribal Consultation**

**March 28, 2008:** The proposed EA (CO-800-2007-043) for the Goodman Point Project was completed and distributed. The EA, with a cover letter summarizing the project and requesting comment by April 30, 2008, was mailed to the 25 tribes identified above.

**April 7, 2008:** Response from the **Hopi Tribe** reiterating previous comments from July 16, 2007, August 22, 2007, and September 16, 2007. Concerns were expressed about potential impacts to the Lightning Tree Tower Group; the failure to comply with the Colorado BLM Site Buffer Standard of 100 meters; the potential for indirect adverse effects to cultural resources; fragmentation of the cultural landscape; and the potential for discovery of human remains.

Based on consultation with the Hopi Tribe, BLM internal comments, and other public comments received on the proposed EA, BLM Managers met with Kinder Morgan to inform the company that the preliminary EA did not support a Finding of No Significant Impact (FONSI):

- An adequate range of alternatives was not analyzed;
- Impacts to cultural resources were not adequately analyzed;
- Insufficient inventory to determine if the proposed locations cause the least impacts to cultural resource values;
- Determination of adverse effect does not comply with Section 106 of the National Historic Preservation Act—
  - 38 eligible sites in close proximity to well locations;
  - Cultural significance to Hopi of both eligible and ineligible sites;
  - Need for mitigation via excavation contradicts Hopi desire for avoidance;
  - Lack of buffer zones and potential for subsurface materials;
  - Disruption of the visual and cultural landscape;
  - Impacts that interfere with the care and management of Monument objects;
  - Potentially eligible Great Pueblo of the McElmo National Register District;
  - Visual adverse effect to the landscape of the District.

BLM recommended additional cultural resource inventory and face-to-face tribal consultation, including a field trip to the project area.

### **Environmental Assessment Follow-up Tribal Consultation**

**September 3, 2008:** Participants for the day included tribal representatives from the **Pueblo of Acoma, Pueblo of Jemez, Pueblo of Laguna, Pueblo of Nambe, Pueblo of Santa Ana, Pueblo of Zia**, the **Ute Mountain Ute Tribe**, and the **Southern Ute Tribe**; BLM representatives; Kinder Morgan representatives; the Crow Canyon Archaeological Center Director of American Indian Activities; and the cultural resources contractor conducting field inventory for the project.

The field trip included the

- Mockingbird Mesa development area with visits to cultural resources sites near well locations and to the Kinder Morgan compressor station; and
- proposed Goodman Point project area on Burro Point with background information about the project, concerns, issues, and conflicts and visits to recorded cultural resource sites, proposed well locations and proposed access and pipeline routes.

The field trip was immediately followed by a meeting and discussion at the Anasazi Heritage Center. Tribal questions and concerns included:

- cultural resources in Canyons of the Ancients National Monument are “their ancestral sites”;
- Monument offers protection and this is a plus for Pueblo people;
- need to increase buffer zones because of proximity of proposed disturbance to cultural resource sites;
- prepare treatment plans in case of discovery of human remains;
- monitor cultural resources during surface disturbing activities and construction;
- recognize “push” for development and determine how to proceed;
- learn from tribal experiences of development on their own land;
- tribes need to find consensus among themselves; and
- help build a model to use in the future.

Tribal participants designated Peter Pino, Pueblo of Zia, and Ernest M. Vallo, Pueblo of Acoma, as tribal representatives for the group during ongoing consultation.

**September 5, 2008:** Participants for the day included tribal representatives from the **Pueblo of Acoma** and the **Pueblo of Zia**; BLM representatives; Kinder Morgan representatives; the environmental assessment contractor and the cultural resources contractor for the project.

The following tribal recommendations were made for proceeding with project modification and impact analysis:

- based on the cultural resource inventory map, examine potential road reroute that might avoid cultural resource sites and provide better buffer zones with least surface impact;
- prevent additional study and mitigation and leave cultural resource sites intact;
- prevent excavation of human remains;
- do not reclaim routes inside site boundaries
- keep well pads as close to roads as possible; and
- gate the road at the entrance to Burro Point area.

**December 1, 2008:** Participants included tribal representatives from the **Hopi Tribe**, the **Pueblo of Acoma** and the **Pueblo of Zia**; BLM representatives; Kinder Morgan representatives; and the cultural resources contractor for the project.

Woods Canyon Archaeological Consultants presented the results of auger testing completed so far in the 100 ft. (30 m.) site buffer established by the Monument Manager for the project. The objective of the auger testing was to determine if subsurface deposits existed beyond the site established boundaries and also to facilitate evaluation of National Register of Historic Places eligibility.

Auger testing was based on a 2 m by 2 m grid. North of the road and the location of the proposed pipeline, auger holes were placed in three lines 2 m apart. South of the road a single line of auger holes were spaced 2 m apart. The buffer zones around potential well pads were tested in the same

manner. Data from the auger cores was recorded and mapping was recorded using GPS. A total of 2,208 hand-excavated auger holes were excavated within these areas. No cultural deposits were found in the auger tests.

Auger testing was also conducted within two sites, 5MT5386 and 5MT6040, where construction impacts would occur. No intact subsurface deposits were found in 5MT5386. Intact subsurface cultural deposits were found in 5MT6940.

A proposed alternate route that avoided all cultural resources, as requested by the tribes, was generated by GIS. This route was examined on the ground by BLM staff. It was subsequently dismissed as an option because of the presence of an archaeological site within the route, steep slopes, and significant potential environmental impacts.

The following tribal recommendations were made for proceeding with project development and impact analysis:

- use existing road;
- limit right-of-way to 25';
- lay CO2 pipeline on surface in areas where subsurface cultural resources likely to be present;
- hydromow work areas to limit ground disturbance and minimize reclamation needs;
- reroute existing road where it currently goes through a cultural resource site;
- use existing disturbed areas for two well locations;
- use horizontal drilling to minimize the number of well locations requiring new disturbance;
- require cultural resource monitor during surface disturbing activities;
- provide revised environmental assessment to tribes for review; and
- if approved, stipulate that cut trees would be provided as firewood for Pueblo use and that a follow-up field visit be conducted after construction was completed.

It was also agreed that gating the road at the entrance to Burro Point area to minimize vehicular access to cultural areas and prevent further OHV impacts should be included as mitigation for project development.