United States Department of the Interior
Bureau of Land Management

Preliminary Environmental Assessment

November 2014

Kinder Morgan HF-4 Well, Access Road, and Pipeline Construction

(*DOI-BLM-CO-S070-2014-0026*)

Location:	**Bureau of Land Management Lands** **Montezuma County, Colorado**
Applicant/Address:	**Kinder Morgan CO_2 Company** **17801 US Highway 491** **Cortez, CO 81321**

Canyons of the Ancients National Monument
27501 Highway 184
Dolores, CO 81323
Phone: (970) 882-5600
FAX: (970) 882-7035

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

APD	Application for Permit to Drill
BLM	Bureau of Land Management
BMP	best management practice
CANM	Canyon of the Ancients National Monument
CDPHE	Colorado Department of Public Health and Environment
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO_2	Carbon Dioxide
COAs	Conditions of Approval
COGCC	Colorado Oil and Gas Conservation Commission
Ecosphere	Ecosphere Environmental Services, Inc.
EA	Environmental Assessment
FEIS	Final Environmental Impact Statement
GHG	greenhouse gases
IDT	Interdisciplinary Team
Kinder Morgan	Kinder Morgan CO_2 Company, LP
NEPA	National Environmental Policy Act
P.L.	Public Law
RFD	Reasonably Foreseeable Development
RMP	Resource Management Plan
SUPO	Surface Use Plan of Operations
Woods Canyon	Woods Canyon Archaeological Consultants

Hovenweep HF-4 Well, Access Road, and Pipeline Construction (*DOI-BLM-CO-S070-2014-0026*)

1. Purpose and Need

1.1 Introduction

This Environmental Assessment (EA) has been prepared to disclose and analyze the environmental consequences of the development of a carbon dioxide (CO_2) gas well and associated infrastructure (Proposed Action), as proposed by Kinder Morgan CO_2 Company, LP (Kinder Morgan). The EA is a site-specific analysis of potential effects that could result with implementation of the Proposed Action or alternatives to the Proposed Action. The EA assists the Bureau of Land Management (BLM) in project planning and ensuring compliance with the National Environmental Policy Act (NEPA). This document is tiered to, and incorporates by reference, the Canyones of the Ancients National Monument Resource Management Plan Record of Decision (RMP/ROD), released in June 2010 (BLM 2010), and the Canyons of the Ancients National Monument Proposed Resource Management Plan and Final Environmental Impact Statement (FEIS), released in July 2009 (BLM 2009). Should a determination be made that implementation of the Proposed Action or alternative would not result in significant environmental impacts or significant environmental impacts beyond those already disclosed in the existing NEPA documents, a Finding of No Significant Impact (FONSI) would be prepared to document that determination.

This chapter presents the purpose and need for the Proposed Action, as well as the relevant issues, including those elements of the human environment that could be affected by the implementation of the Proposed Action. The potential environmental effects of the alternatives considered in detail for each of the identified issues are analyzed in Chapter 4. The No Action alternative, which describes the baseline, is presented for comparison.

1.2 Background

Kinder Morgan is proposing to drill a new CO_2 well and construct a new pipeline that connects the well to a nearby cluster (processing) facility. The proposed project would consist of a new well and well pad located on privately owned land and minerals with a connecting pipeline (also called a flowline), an electric line and a water line on both private and Canyons of the Ancients National Monument (CANM) land. CANM is administered by the Bureau of Land Management (BLM) Tres Rios Field Office. The project is entirely within the federal McElmo Dome Lease Unit, COC 47653X. The connecting pipeline would terminate at the HF Cluster Facility situated approximately 3,884 feet east of the proposed well pad location. The HF Cluster Facility is immediately adjacent to the Hovenweep Compressor Station. A map of the proposed project location is shown in Figure 1.

On August 27, 2013, Kinder Morgan submitted an Application for Permit to Drill (APD) to the Colorado Oil and Gas Conservation Commission (COGCC) for the proposed well drilling project. The APD was approved by COGCC on September 26, 2013. On May 21, 2014, a Sundry Notice was submitted to the BLM for the construction of the connecting pipeline, electric line and water line on CANM. Kinder Morgan would require a federal permit for the portion of pipeline work across CANM; while no federal permit is required for the private surface/private mineral well or pipeline work on private land, that part of the project will also be analyzed in this EA as a Connected Action.

The lease information, legal description, and well depth are provided in Table 1. Unless otherwise stated, the "project area" consists of the well pad, well pad access road, pipeline right-of-way (ROW) and staging areas, temporary use areas and an ephemeral protection area. The HF-4 well and pad would be located adjacent to the exterior boundary of CANM along its north side and approximately 1,403 feet from the exterior boundary of CANM on its east side. The proposed project would begin construction upon completion of all permitting and environmental regulatory compliance requirements, as early as December 2014, and would require approximately five months to complete.

Table 1. Lease Summary and Legal Description for Proposed Well Location

Well Name	Mineral Lease #	Surface Location (Ownership)	Bottom Hole Target Formation (Mineral Ownership)	Vertical Depth (feet)
HF-4	Surface Use Agreement	425 feet from the south line and 2,293 feet from the west line; Section 1, Township 37 North, Range 19 West (Fee)	1,575 feet from the north line and 2,293 feet from the west line; Section 12, Township 37 North, Range 19 West (Fee)	8,330

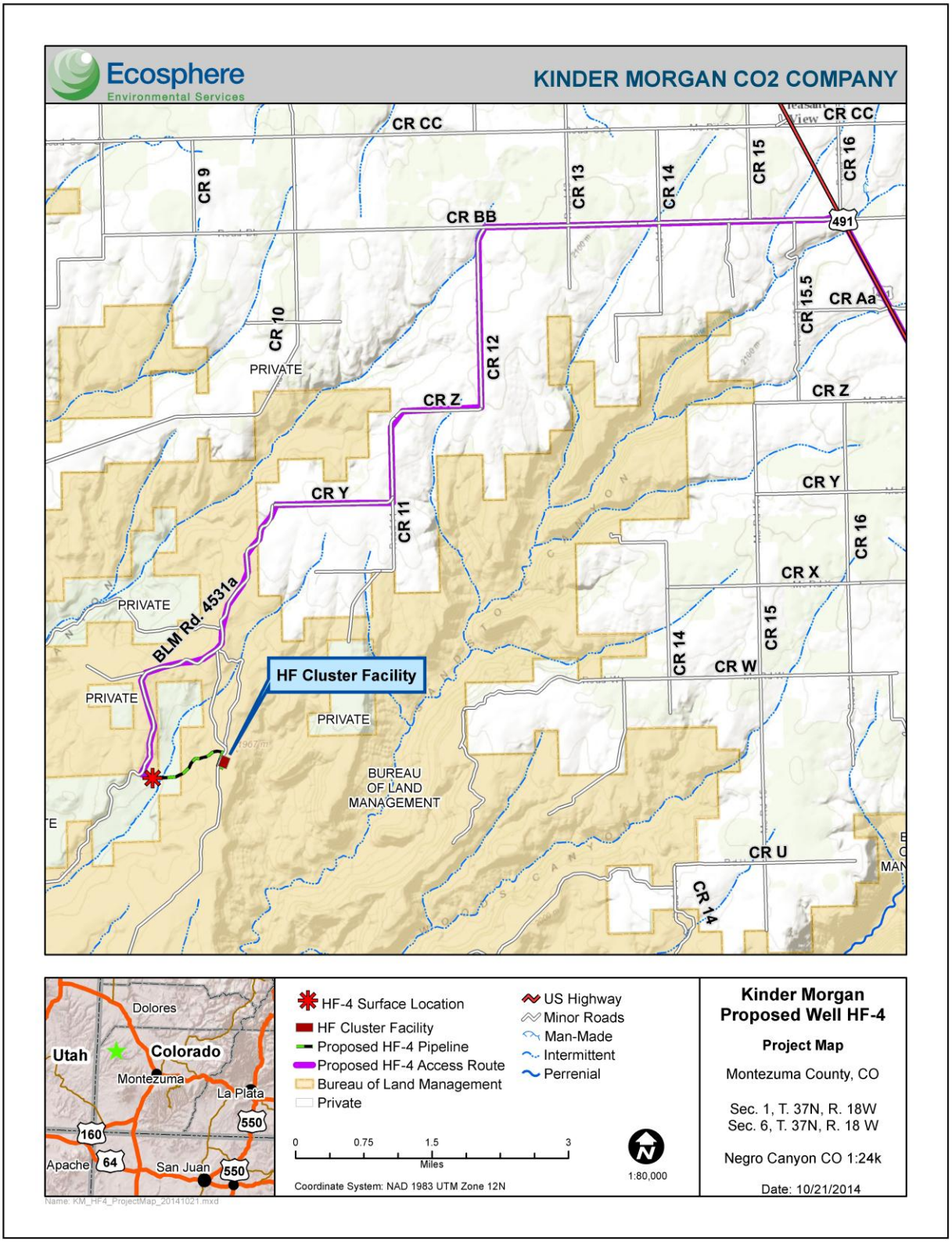

Figure 1. Kinder Morgan HF-4 Location Map

1.3 Need for the Proposed Action

Kinder Morgan filed a Sundry with the BLM Tres Rios Field Office on May 21, 2014, with details about the Proposed Action. The BLM's need is to respond to the applicant's Sundry Application for the proposed pipeline in accordance with the Mineral Leasing Act of 1920, as amended (30 United States Code [U.S.C.] 181 et seq.), by Title V of the Federal Land Policy and Management Act of 1976, as amended (43 U.S.C. 1761-1771), and the Federal Onshore Oil and Gas Leasing Reform Act of 1987.

The BLM would consider the Proposed Action in a manner that: (1) avoids or reduces effects on resources and activities, as identified in the Resource Management Plan (RMP) (BLM 2010); (2) best meets the objectives of the BLM; (3) is consistent with the lease rights granted to the applicant; and (4) prevents unnecessary or undue degradation of public lands.

1.4 Purpose(s) of the Proposed Action

The purpose of the Action is to provide Kinder Morgan the opportunity to produce commercial quantities of CO_2 from a privately owned minerals well within a federal unit. Fluid mineral exploration and development is a management action that is in conformance with the Canyons of the Ancients Resource Management Plan (BLM 2010), see 1.5.1 below.

1.5 Decision to be made

The BLM will decide whether or not to approve the Sundry Application, and if so, under what terms and conditions.

1.5.1 Conformance with BLM Land Use Plan(s)

The Proposed Action is subject to and has been reviewed for conformance with the following land use plans and amendments [43 Code of Federal Regulations (CFR) 1610.5, BLM 1617.3]:

Plan:	Resource Management Plan for Canyons of the Ancients National Monument.
Date Approved:	June 2010
Page Number:	Page 5 states "The Monument Proclamation requires that existing lease rights be honored. However, it also requires that development should not create any significant new impacts to cultural resources or to other objects that the Monument was established to protect." While the Proclomation and RMP do not address development of private minerals, 43 CFR 3105.2-2 states that operations under a federal unit are deemed as operations under a lease.

The Proposed Action is in conformance with the RMP, even though it is not specifically provided for, because it is clearly consistent with the RMP decisions (objectives, terms, and conditions) for the Fluid Minerals and Energy Resources Program. The Proposed Action would fulfill the objective and intent of the RMP that mineral resources are developed in a way that

does not create significant new impacts to cultural resources, and, thus, is in conformance with the RMP.

1.6 Relationship to Statutes, Regulations, or Other Plans

Exploration and development of federal fluid mineral leases by private industry is an integral part of the BLM's fluid mineral 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).

The BLM regulates fluid mineral development to minimize environmental effects to public lands as required by, but not limited to, the following Federal Laws:

- The Mineral Leasing Act of 1920, as amended (30 U.S.C. 181 et seq.)
- The Mining and Minerals Policy Act of 1970 (30 U.S.C. 21)
- The Federal Land Policy and Management Act of 1976, as amended (43 U.S.C. 1761-1777)
- The Federal Onshore Oil and Gas Leasing Reform Act of 1987 (30 U.S.C. 195 et seq.)
- The Endangered Species Act of 1973 (Public Law [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 (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"
- The National Environmental Policy Act of 1969
- The National Trails System Act of 1969, as amended (P.L. 90-543)

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 Design Features, complies with the laws and implementing regulations indicated above.

Table 2 provides a summary of federal, state, and local approvals/permits relevant to the Proposed Action.

Table 2. Potential Authorizations, Permits, Reviews, and Approvals

Permit or Approval	Entity
Federal	
Sundry	Bureau of Land Management
State	
Forms 1, 2, 2A, and 3	Colorado Oil and Gas Conservation Commission
Local	
Access Approach and Road High Impact and Special Use Permits	Montezuma County, Colorado

1.6.1 Conformance with Colorado Standards for Public Land Health

In February 1997, the Colorado BLM's standards for public land health were approved by the Secretary of the Interior. 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 Land Health are:

1. Ensure 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.
5. Ensure 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 they 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 Chapter 3.

1.7 Scoping and Identification of Issues

COGCC and BLM specialists participated in the on-site visit on September 11, 2013 for the project. COGCC and BLM comments were taken into consideration when developing the Proposed Action. The Proposed Action was listed on the BLM's online NEPA Register

(http://www.blm.gov/co/st/en/BLM_Information/nepa/TRFO_NEPA.html) on May 23, 2014. A letter soliciting public comments on the proposed project was sent to stakeholders and published in the NEPA register. A public scoping period was held from June 6, 2014, until July 6, 2014, and three comment letters were received.

The BLM Interdisciplinary Team (IDT) completed a preliminary analysis of all resource areas, including consideration of the issues identified at the on-site visits. The administrative record includes the IDT checklist of resources considered for the project and identifies four issue statements that are listed below requiring further detailed analysis:

1. What are the effects of the Proposed Action on cultural resources and Native American religious concerns?
2. What are the greenhouse gas emissions associated with the Proposed Action?
3. What effects would the pipeline cause to visual management and would the Proposed Action meet the BLM Visual Resource Inventory (VRI) Class designation?

1.8 Issues Considered but Eliminated from Further Analysis

The IDT identified five resource areas (identified in the issue statements listed above) that require detailed analysis in Chapters 3 and 4. The remainder of the resources considered have been eliminated from further analysis. The resources eliminated and rationale for their exclusion are detailed below:

- Air quality: Kinder Morgan prepared an emissions inventory for the project using BLM's on-line emissions estimation application version 3.0. A summary of this emissions inventory is included in Appendix B. After review of this inventory, it was determined that the proposed activities would be below emissions thresholds for permitting or notification requirements. The proposed emissions are consistent with the reasonable foreseeable development scenario analyzed in the RMP and within those described in the Final Environmental Impact Statement (FEIS) (BLM 2010), therefore further analysis is not necessary because this is tiered to the FEIS.
- The following resources are not present in the project area:
    - Farmlands Prime or Unique
    - Wild Horses and Burros Herd Management Areas
    - Wild and Scenic Rivers,
    - Wilderness/Wilderness Study Areas
- Environmental Justice: There would be no low-income or minority populations adversely affected by the Proposed Action.
- Floodplains: The Design Features in the Proposed Action, particularly stormwater Best Management Practices (BMPs) would be adequate to protect floodplains.

- Fuels/fire management: CANM is designated as "Fire Management Zone B," an area where natural fire is generally not desired under current conditions and suppression is emphasized. The Design Features of the Proposed Action, including a fire response plan and an onsite fire response trailer, would be adequate environmental protections.
- Lands/Access: The Proposed Action and associated activities would occur within the McElmo Dome Unitized area and are covered by the McElmo Dome Unit Agreement; therefore, no Lands and Realty permitting would be necessary.
- Lands with Wilderness Characteristics: There are no lands with wilderness characteristics in the Project Area.
- Mineral resources/geology/energy production: Surface effects would be avoided through implementation of Design Features included in the Proposed Action. The CANM RMP does not allow new solid minerals locations, so there should not be conflicts with solid mineral extraction. If successful, the well would produce from privately owned minerals within the McElmo Dome unit. Most of the surrounding subsurface area is either privately owned or federally owned and currently leased. This well would allow Kinder Morgan to extract from their CO_2 unit lease, as allowed and analyzed under the CANM RMP.
- Noxious weeds: The Design Features in the Proposed Action (including weed treatments and control, and power washing equipment before entering the project area) would be adequate environmental protection.
- Paleontology: Survey of the project area was conducted on October 1, 2014. The BLM paleontological resource specialist was able to examine the previously excavated material in the existing pipeline ROW and determined that a large portion of the proposed pipeline route would primarily go through relatively thick eolian soil. No vertebrate fossils of other fossils of scientific significance were observed during the survey. The measures included in the Design Features and Conditions of Approval would protect fossils of scientific significance in the unlikely event that these resource were uncovered during project construction
- Rangeland health standards: The Proposed Action would occur within the Cahone Mesa Grazing Allotment. The Design Features for the Proposed Action, including reseeding and rehabilitation, would minimize long-term loss of forage or short term impact to the grazing management within the allotment. The majority of the proposed pipeline already occurs within a previously disturbed pipeline ROW; therefore, there are minimal impacts to rangeland health.
- Recreation: Impact to recreation would be associated with increased traffic on the roads accessing the project area. However, the increased traffic would be temporary and an incremental addition to the current traffic in the area, so the impacts would be negligible for the Proposed Action.

- Socioeconomics: The Proposed Action would support on-going CO_2 production and associated employment and tax revenue in Montezuma County. There would be no measurable difference between current socioeconomic conditions and those with the Proposed Action.
- Soils: The Design Features for the Proposed Action, particularly storm water BMPs, would be adequate to protect soil resources, and no adverse impacts are expected.
- Special Status–Plants: There are no known populations or designated habitat for special status plant species in the project area.
    - Naturita milkvetch: Although there is potential habitat near, but not in, the project area for this species, the plants are limited to sandstone ledges, crevices or sandstone slopes. There is only a very short section of the proposed pipeline that occurs in this habitat type. This section of the pipeline route with potential habitat was previously disturbed by construction of the existing pipeline.
- Special Status–Wildlife: For the Proposed Action, impacts would be caused by temporary displacement and disturbance during construction. Minimal vegetation clearing would occur along the existing ROW. The Design Features for the Proposed Action, including timing limitations to minimize disturbance to migratory birds and raptors, would be sufficient to protect special status wildlife species.
- Vegetation/ Forest Resources: The minimal loss of piñon-juniper (*Pinus edulis-Juniperus osteosperma*) woodland and sagebrush (*Artemisia tridentata*) steppe in the project area would be insignificant and offset by reclamation using BLM-approved native seed mixes. The majority of the proposed pipeline already occurs within a previously disturbed pipeline ROW that was previously re-seeded.
- Wastes (hazardous or solid): While the Proposed Action has potential to create hazardous and solid waste, design Features such as closed-loop drilling and hauling away cuttings, cleaning up spills immediately, and removing garbage and sewage, would be adequate mitigations.
- Wetlands and Riparian Zones: The Design Features for the Proposed Action, particularly the stormwater BMPs, would be adequate to protect wetlands and riparian zones from adverse effects.
- Wildlife-Terrestrial and Fish: The Proposed Action is not expected to have measurable adverse effects to terrestrial wildlife as the project area does not include critical winter range for big game. The Design Features included in the Proposed Action relevant to wildlife include timing limitations and buffers on surface disturbance to protect raptors, eagles, and migratory bird nesting periods. These measures would be adequate to minimize adverse wildlife impacts.
- Water Resources/Water Quality: The Design Features for the Proposed Action, particularly the stormwater BMPs, would be adequate to protect wetlands and riparian zones from adverse effects.

2. Description of Alternatives, Including Proposed Action

2.1 Introduction

The Proposed Action has been submitted by Kinder Morgan to allow for development of CO_2 resources in the McElmo Dome Unit, while minimizing environmental effects to surface resources. The Proposed Action consists of drilling a CO_2 well on private land and installing a new well-tie pipeline to connect the well to Kinder Morgan's HF Cluster Facility in Montezuma County, Colorado. An electric line and water line would be installed in the same trench to remove produced water from the well if production conditions warrant. Archaeological, paleontological, biological, and surface hydrological resources were considered in order to best identify the proposed pipeline route.

The BLM reviewed the following information when adjusting the location of the Proposed Action elements to identify and minimize the environmental effects.

- Conversation with the private surface owner on September 3, 2013.
- On-site held September 11, 2013.
- 2013 Class III Archaeological Inventory of Kinder Morgan CO_2 Company's Proposed HF4 Well, Access Road, and Pipeline, on Canyons of the Ancients National Monument and Private Lands, Montezuma County, Colorado (MT.LM.R495) (CANM13020).
- Colorado Oil and Gas Conservation Commission (COGCC) – APD and Surface Use Review and notification of surrounding landowners, approved on September 26, 2013.
- Montezuma County High Impact Permit and Special Use Permit approved on July 22, 2013, for the proposed activities on private surface.
- Paleontological surveys, completed on October 1, 2014.
- Special Status plant species and vegetation clearance report completed by Ecosphere Environmental Services on November 4, 2013.
- Site Specific Data Sheet completed for Kinder Morgan's Storm Water Management Plan filed with Colorado Department of Health and Environment (CDPHE) on April 11, 2014.
- Baseline water well testing as required by COGCC, completed in October, 2013.

The alternatives considered in detail are described below, followed by alternatives considered but eliminated from further analysis. The environmental effects described in Chapter 4 are based upon the detailed description of the project alternatives. The Proposed Action includes the Design Features described by the applicant in the Sundry Application packages (see Appendix C for the Surface Use Plan of Operations). In addition, Kinder Morgan would abide by the Conditions of Approval (COAs) specified by the BLM (COAs can be found in Appendix A).

2.2 Alternative A – No Action

The No Action alternative is a denial of the Sundry described in Alternative B – Proposed Action. By deciding upon the No Action alternative, the proposed construction of the well-tie pipeline would not occur on lands managed by the BLM. The BLM can deny the Sundry if the proposal would violate lease stipulations, applicable laws and/or regulations, or to prevent undue or unnecessary environmental degradation. The denial does not deny the right to drill and develop the Unit, or the right to drill the private surface/private mineral well, and Kinder Morgan could submit another Sundry proposing an alternative pipeline location or construction methods, or could submit an APD proposing alternative well and pipeline locations, including locations on CANM surface.

2.3 Alternative B – Proposed Action

Kinder Morgan proposes to construct a new well pad on a private surface location, to drill a new well and lateral on private land to access the private mineral estate, and to construct a new pipeline on private and BLM-managed land to connect the well to the HF Cluster Facility in Montezuma County, Colorado. The well would be drilled in the McElmo Dome Unit, developing privately owned mineral resources (i.e., CO_2) from the Leadville Formation. A summary of the proposed construction activities is provided in Section 2.3.3. Kinder Morgan's proposal includes design features such as adherence to the Surface Use Plan of Operations (SUPO, Appendix C), stipulations, and standard operating procedures, which would be implemented to minimize or eliminate potential adverse effects to protected resources. See Section 2.3.7.1 for a summary of the design features.

2.3.1 Location and Access

The proposed well pad and access road are located approximately 20 miles northwest of Cortez Creek, Colorado, on private land in Section 1, Township 37 North, Range 19 West. Existing county and BLM roads would be used for construction access to the site and would not require upgrades to support the proposed construction activities. The access road on private land would be improved as described in Section 2.3.2. The proposed pipeline is on private and public lands managed by the BLM, in Section 1, Township 37 North, Range 19 West and Section 6, Township 37 North, Range 18 West. A copy of the draft Surface Use Plan of Operations (SUPO) for the HF-4 well was sent to the private surface owner in May 2014.

The access route to the well pad location from United States (U.S.) Hwy 491 is outlined in Figure 1. The driving directions to reach HF-4 from the intersection of Hwy 491 and County Road BB are as follows:

- Travel west on County Road BB for 4 miles.
- Turn left (south) on County Road 12 for 2 miles.
- Turn right (west) on County Road Z for 1 mile.
- Turn left on County Road 11 for 1 mile.

- Turn right (west) on County Road Y for 1.3 miles.
- At the CANM border, County Road Y becomes BLM Road 4531a, and turns left (south) through several curves for 2.7 miles.
- Continue left (south) for 1 mile to a fork in the road.
- Stay left at the fork and continue 1000 ft. to the location access.
- Proposed access would be on the left (east) side of the road. Location is 700 ft. southeast of the existing road.

2.3.2 Description of Project

The proposed project area, as shown in Figure 2, includes construction of a well pad on a previously disturbed agricultural field on private surface, improvements to the access road on private surface, construction of a pipeline, electric line and water line on private surface and in a previously reclaimed pipeline ROW on BLM surface, and connection to the existing HF Cluster facility. Surface disturbance is summarized in Section 2.3.7.

The well pad is designed to maximize the area that would be reclaimed during interim reclamation operations and minimize the amount of surface needed to ensure safe long-term operations. All drilling operations would use a closed-loop mud and fluid system; therefore, a reserve pit would not be necessary for the drilling of the proposed well. The surface disturbance for the well pad, located entirely on private land, would occupy approximately 5.6 acres. The well pad would be roughly rectangular, with dimensions of 350 feet by 380 feet, with an additional area for segregated topsoil and spoil piles. After construction, 5 acres would be reclaimed, leaving about 0.6 acres for the production pad.

Currently, the well pad access road on private land is a faint two-track, which Kinder Morgan proposes to improve to support well pad construction and drilling. The improved access road would be approximately 500 feet in length with a travel-road width of 18 feet. The access road would be surfaced with 12 inches of gravel. Estimated surface disturbance for the improved access road is 0.5 acres, all on private land. The access road would be maintained to accommodate year-round traffic and prevent soil erosion.

The pipeline, electric line and water line would be constructed in the same corridor. Approximately 4,271 feet of the pipeline would be located on CANM, mostly within an existing pipeline corridor that was previously reclaimed. On CANM, the pipeline corridor width would be limited to the previous disturbance width (approximately 45 feet), except at two locations specified in the pipeline plat where corridor width may extend up to 55 feet, an additional 10 feet wider to the south of the existing ROW alignment to allow a gentler turning radius on the pipeline. Estimated surface disturbance for the pipeline corridor on CANM is approximately 4.4 acres. Approximately 1,743 feet of the pipeline would be located on private land, in an area with no previous pipeline disturbance. On private land, there would be a construction corridor width of approximately 50 feet, for a total pipeline surface disturbance on private land of 2.0 acres.

There would be a staging area located on the east end of the pipeline route, and a temporary use area would be located on CANM, as shown in Figure 2. Two temporary use areas would be located on private land. The staging area and each temporary use area would be approximately 7,500 square feet (150 feet long by 50 feet wide).

As indicated in Figure 2, there is an area on CANM where there are several small ephemeral drainages. In this "ephemeral protection area," additional stormwater controls and engineered BMP would be required to sufficiently protect water quality and minimize erosion control.

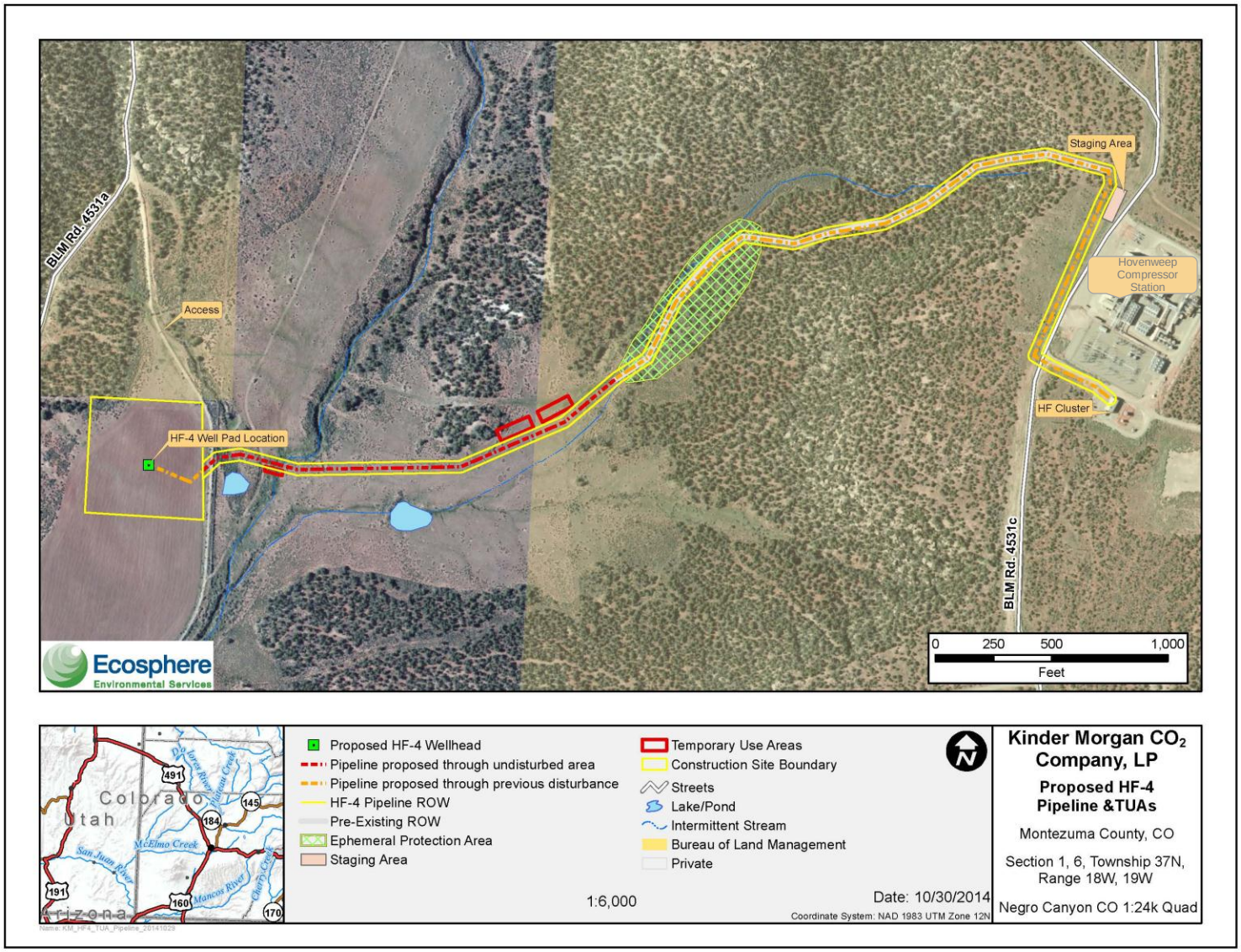

Figure 2. HF-4 Project Area Map

2.3.3 Project Construction

All construction operations would conform to standards indicated in the BLM and U.S. Forest Service *Surface Operating Standards for Oil and Gas Exploration and Development* (The Gold Book) (USDI/USDA 2007), Montezuma County road specifications, and private landowner surface use agreements.

2.3.3.1 Well Pad and Access Road Construction

Construction access would use existing roads, as described in Section 2.3.1 and illustrated in Figure 1. The sections of access road under Montezuma County Road and Bridge jurisdiction would be maintained by Kinder Morgan per agreement with the county and commensurate with Kinder Morgan traffic levels. The access road on private land would be improved to a graveled, 18 foot wide running surface. Construction material (e.g., gravel, structural stormwater BMPs, material, etc.) not available on-site would be hauled to the Project Area from an off-site location.

The well pad location would be constructed from the present native soil/rock material. The pad would be cleared of vegetation, leveled by standard cut and fill techniques, and graded to provide a work area for the drilling activities. Stripped vegetation, topsoil, and excess material would be separated and stockpiled along the southern and western edges of disturbance. These materials would be reserved for use during interim reclamation.

2.3.3.2 Well Drilling

The drilling activities would be completed with a closed-loop drilling system. This type of system utilizes solids-control equipment operated on the well pad location to dewater drilling solids and recycle drilling fluids during the drilling process. The closed-loop drilling system is beneficial because it does not require open drilling pits, isolates waste products from the environment, reduces potential for spills, and reduces wildlife exposure to hazardous materials.

Drilling fluids and mud additives would be re-circulated into the well during drilling. The drilling fluids would be recycled whenever practical. 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. Produced water or spent fluids would be hauled to a Class I non-hazardous disposal well.

Production casing would be run and the well would be completed for production following drilling. The completion activities would include the vertical sections and the horizontal sections included at the bottom of each vertical boring, and conducting wireline logging to map the geologic formations at the end of drilling operations.

The estimated traffic along the proposed access route for the well pad and access road construction and well drilling would average of 65 trips per day for the 5 month construction and drilling period. The highest traffic day is estimated to have 330 trips. Kinder Morgan has agreements with Montezuma County and Colorado Department of Transportation to maintain the

affected roads and to install traffic controls required to maintain safe travel for these traffic levels.

2.3.3.3 Pipeline Construction

The well-tie pipeline would be constructed within an existing Resolute Energy Corporation pipeline ROW for the majority of the route. The proposed pipeline would be offset by a minimum of 10 feet from the existing pipeline. The pipeline would be a 10-inch carbon steel pipeline with a High Density Polyethylene liner with a capacity of 50 million cubic feet per day. A 2-inch water line and 2-inch electric conduit line would also be installed within the same trench with the proposed pipeline, for later use if production conditions deem necessary.

Typical pipeline construction consists of clearing the corridor, trenching the ditch to 5 or 6 feet, stringing and welding the pipe, and placement of the pipe in the trench, placing the electric and water line in the same trench, backfilling the trench, and reclamation of the disturbed areas of the corridor. Equipment, vehicles and soil or woody debris may be temporarily placed on the staging and temporary use areas during construction, but will be removed when construction is completed. Wash crossings and temporary travel in the ephemeral drainage protection area along the pipeline route would be constructed according to the engineered drawings prepared as part of the site specific data sheet and stormwater plan – no tree removal or major dirt work will occur in that area.

Construction traffic for the pipeline would average eight pick-up truck trips per day during the estimated 8- to 10-week construction period. Mobilization of pipeline construction would involve approximately six heavy transport loads, and a tractor-trailer load of pipe material would be delivered along the pipeline route approximately once every three days. Pipeline construction and associated traffic would generally occur during weekdays and may occur concurrently with well pad and access road construction. Pipeline construction may occur concurrently with well pad and access road construction and well drilling.

2.3.4 Solid Waste Management, Hazardous Materials, and Safety

Kinder Morgan and its contractors will ensure that all use, production, storage, transport, and disposal of hazardous materials or hazardous wastes associated with drilling, completion, and production of the well and project operations will be in accordance with all applicable existing or hereafter promulgated federal, state, and local government rules, regulations and guidelines. Kinder Morgan will implement the design features and best management practices included in the SUPO for solid waste management, hazardous materials, and worker and public safety. Some of these measures include:

a) Produced water will be reused at another drill site or hauled to a Kinder Morgan Class I non-hazardous disposal well.
b) Drilling fluids will be recycled whenever practical, or disposed of as described in a) above. The following will be conducted to accomplish the task of handling the drilling fluids and drill cuttings waste materials:

i. The free liquids from the closed-loop system will be removed via vacuum truck. The liquids will be hauled for reuse to another drilling location or disposed in a Kinder Morgan disposal well.
ii. The closed-loop system keeps fresh water cuttings separated from the salt formation and brine water cuttings. The fresh-water cutting contents of the closed-loop system will be tested using the COGCC procedures. Salt cuttings will also be tested according to COGCC procedures. If they pass the test, all cuttings will be disposed of at the Montezuma County Landfill.

c) Spills and leaks will be cleaned up immediately, and contaminated soils will be removed to a permitted disposal site. COGCC spill reporting procedures will be followed.

2.3.5 Well Production

An average successful CO_2 well may produce for approximately 30 years. The production facilities that would be located on the well pad after construction is completed include the wellhead and pipeline spool section. If produced water is present in the production stream, a glycol skid may be installed at the well location during winter months (November to April) annually. An electric water pump may be installed at the location if produced water builds up in the pipeline. The water pump would be powered by the electric line constructed in the pipeline corridor, and water would be drained through the water line in the same corridor. Gas production activities such as water removal and compression for this well would occur at the HF Cluster Facility.

The estimated traffic for well production and maintenance include one vehicle trip per week and an additional truck trip per month if a glycol skid is installed at the well. There would be quarterly trips to inspect the pipeline.

2.3.6 Reclamation

All disturbed areas would be reclaimed according to instruction from the BLM, private surface owner, and project design features. The private surface owner will direct reclamation on private land. Reclaimed areas receiving incidental disturbance during production operations would be reseeded as soon as practical and at times of the year intended to facilitate regrowth of vegetation. Kinder Morgan would modify its reclamation procedures as necessary to achieve the reclamation outcomes agreed upon with the BLM and private surface owner. Kinder Morgan would submit all required documentation to notify the BLM of reclamation actions and extent of reclamation progress or completion.

The goal of surface reclamation is to achieve (to the extent possible) final reclamation standards, including the development of a self-sustaining, vigorous native and/or desirable vegetation community with a density sufficient to provide a stable soil surface and inhibit the growth of noxious and/or invasive species. Reclamation operations would be performed to return the disturbed area to productive use and meet the resource objectives of the land.

Reclamation would be conducted in two phases—interim and final. Interim reclamation would be performed following well completion and extend through the production period. Interim reclamation would be performed on disturbed areas not required for production operations. Final reclamation would be performed following well abandonment. Reclamation operations in both phases may include (but are not limited to) re-contouring the surface to approximate the features of the natural topography, restoring drainage systems, distributing topsoil and/or excess material, seeding with desired vegetation, placing stockpiled woody material on the reclamation area, and weed control.

Surface disturbance from construction of the well pad would be approximately 5.6 acres, all of which would be on private land. Following completion operations, portions of the well pad totaling 5 acres not needed for production would be reclaimed. Assuming interim reclamation success, long-term surface disturbance at the well pad would be reduced to approximately 0.6 acres. The entire proposed pipeline route would be reclaimed immediately following completion of construction activities.

2.3.7 Surface Disturbance Summary

Initial disturbance would be the amount of land needed for construction, drilling, and completion operations. Initial disturbance would last less than 5 years and is considered short term. Operational disturbance would consist of lands needed for production operations, lasting greater than 5 years, and is considered long term. Initial disturbance for the Proposed Action on CANM would be 4.8 acres and on private land would be 8.4 acres, as shown in Table 3. Approximately 2.6 acres of the pipeline ROW will be new disturbance: 2 acres on private surface and 0.6 acres on CANM surface. The other 10.6 acres are re-disturbance of agricultural fields on private land, or redisturbance of an existing pipeline ROW on CANM.

There would be no long-term disturbance on CANM, as the pipeline ROW and staging areas would be reclaimed immediately after construction. The long-term disturbance on private land would be 1.1 acres.

Table 3. Surface Disturbance Summary for Proposed Action

Project Component	Length (feet)	Estimated Temporary Disturbance (acres)	Estimated long-term Disturbance (acres)
Well pad (Private Surface)	–	5.6	0.6
Access Road (Private Surface)	500	0.5	0.5
Pipeline – (Private Surface) (50 foot width)	1743	2.0	0
Pipeline – (CANM Surface) (45 foot width)	4271	4.4	0
Staging/Temporary Use Areas (Private Surface)	–	0.3	0
Staging/Temporary Use Areas (CANM Surface)	–	0.4	0
TOTAL		**13.2**	**1.1**

2.3.7.1 Project Design Features

Kinder Morgan's proposal includes design features such as adherence to the SUPO, stipulations, and standard operating procedures, and would be implemented to minimize or eliminate potential adverse effects to protected resources. The design features as part of the Proposed Action from the SUPO are summarized below. The entire Surface Use Plan including a complete description of design features is shown in Appendix C.

- The access roads shall be maintained reasonably smooth and free of ruts in excess of 3 to 4 inches, soft spots, chuckholes, rocks, slides, and washboards. A regular maintenance program shall include blading, ditching, sign replacement, surfacing, culvert maintenance, and maintenance of stormwater features.
- All soil removal operations and trenching for the well pads, pipelines, and building of access roads would be monitored by a BLM or BLM-permitted archaeologist for subsurface cultural resources.
- Any spills would be promptly cleaned up and all wastes disposed as required by federal and state regulations.
- Water for drilling and completion would be hauled by truck from a privately owned, off-lease source. The preferred source would be the Dolores Water Conservancy District canal, with the alternate source being the City of Cortez. Consultation with the U.S. Fish and Wildlife Service has been completed regarding impacts of water withdrawals on threatened and endangered species.

- No reserve pit would be constructed. Produced water from the closed-loop system would be removed via vacuum truck and hauled for reuse to another drilling location or disposed in Kinder Morgan disposal wells.
- All components of the closed-loop drilling system and all non-fresh water tanks (including hose and manifold connections) would be located within impermeable, lined (with at least 30-mil liner) areas capable of containing 120 percent storage capacity of the largest container in the area. Absorbent pads, impermeable liners, or spill-guard systems would be placed under all drilling equipment engines. The liners would be visually inspected prior to installation on location. Any equipment placed on the liner would be placed on traction mats/pads protecting the liner surface. All solid drill cuttings waste would be collected and stored in leak-proof, roll-off containers and transported to and disposed at an off-site licensed commercial waste disposal facility. Drilling fluids would be recycled whenever practical.
- Degreasing machinery or equipment would occur on the liner in order to protect soils from contamination.
- Throughout the lifetime of the project, trash, and debris would be collected from the location and surrounding area and removed to the Montezuma County Landfill. Trash would be stored in an appropriate on-site trash bin that would prevent loss due to wind and that would be periodically hauled to a permitted landfill or disposal site.
- Sewage generated on-site would be stored in a Montezuma County-approved closed system and then hauled under existing permit to the City of Dolores licensed sewer treatment plant.
- Kinder Morgan and its contractors would ensure that all use, production, storage, transport, and disposal of hazardous materials or hazardous wastes associated with the drilling, completion, and production of the well would be in accordance with all applicable existing or hereafter published federal, state, and local government rules, regulations, and guidelines. A variety of chemicals including lubricants, paints, and additives would be used during well drilling activities. These materials would be temporarily kept in limited quantities on the well pad. Material Safety Data Sheets (MSDS) would be maintained by Kinder Morgan contractors for all materials used on the location; chemical containers would display MSDS labels.
- Heavy equipment will be pressure-washed at an off-site location prior to entering the project area (defined as the well pad, new access road and the entire length of the HF-4 pipeline). This is a preventive measure for reducing noxious weed infestation at the drilling site. Kinder Morgan will be responsible for control of all State-listed noxious weed species on all disturbed areas.
- During interim reclamation, those portions of the well pad deemed unnecessary for production would be shaped to conform to the natural terrain (using 100 percent of the stockpiled topsoil) and would be reseeded, leaving only a small teardrop for access to the

wellhead during operations. Interim reclamation shall begin as soon as possible after completion of the well and final production activities.

- On BLM land, the disturbed areas will be broadcast or drill seeded with a BLM-approved seed mix during interim reclamation. On private land, the seed mix would match property owner specifications.
- Interim reclamation would be considered successful when the desired vegetative species are established, erosion is controlled, weeds are considered a minimum threat, and a uniform vegetative cover has been established with an individual plant density of at least 70 percent of pre-disturbance levels. Kinder Morgan would continue re-vegetation efforts until this Colorado Department of Public Health and Environment standard is met.
- 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 before the re-spread of topsoil and subsequent reseeding according to the landowner-specified seed mix. The access road would be shaped to conform to the natural terrain and left as rough as possible to deter vehicle travel. Access would be ripped (along the contour, when possible) to a minimum depth of 6 inches, water barred, and reseeded with an approved seed mix.
- No surface-disturbing activity would be allowed within 1/4 mile of documented active raptor nests from March 15 to August 31, annually, prior to a raptor nest occupancy survey for the current breeding season. This timing limitation applies to construction, drilling, completions operations, reclamation, placing of production equipment, and associated infrastructure to include roads and pipelines.
- During migratory bird breeding season, from May 15 to June 30, if vegetation must be cleared for construction, migratory bird nest searches are required prior to any ground disturbance where nesting habitat occurs in the proposed action area. If active nests were found, vegetation removal would be postponed until after the nest successfully fledges young or fails, as determined by a biologist.
- Stormwater controls will be implemented, inspected, and maintained for the well pads, roads, and production lines until final stabilization (as defined by CDPHE) has been achieved.
- The access roads and well pads would be adequately surfaced and shall be wetted down and compacted where needed to avoid dust and loss of soil through wind or water erosion.
- Before beginning any work, it is the responsibility of the Kinder Morgan to ensure that all employees and subcontractors of Kinder Morgan are informed by Kinder Morgan before commencement of operations that any disturbance to, defacement of, or collection or removal of archaeological, historic or sacred material will not be permitted. Violations of the laws that protect these resources will be treated as law enforcement/administrative issues.

- Kinder Morgan will ensure that all employees and subcontractors of Kinder Morgan will not disclose or release information regarding the nature and location of archaeological, historic, or sacred sites, without written approval by the BLM, pursuant to 43 CFR 7.18. Cultural resource 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 considered a violation of Federal statute.
- Pursuant to 43 CFR 10.4, Kinder Morgan will notify the Canyons of the Ancients National Monument Archaeologist, Vince MacMillan (970-882-5614), by telephone, with written confirmation, immediately upon discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, Kinder Morgan will stop activities in the vicinity of the discovery and protect it until notified to proceed by the BLM Authorized Officer.

  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 will be notified immediately at 970-882-5614 and the following procedures will be carried out: 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 BLM or BLM-permitted archaeologist. The Monument archaeologist will make a determination of the nature and significance of the discovery, and will determine the appropriate method of treatment for it. The permitted archaeologist will prepare any and all necessary treatment plans, with approval 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.
- All soil removal operations and trenching for the well pads, pipelines, and building of access roads would be monitored by a BLM or BLM-permitted archaeologist for subsurface cultural resources.

  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).

Sites determined as "not eligible" for the National Register of Historic Places located 10 meters or less from construction will be monitored once during initial ground disturbance. Monitoring results will be submitted in writing upon completion of each phase (initial, periodic, and final).

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 operations.

2.4 Alternatives Considered, but Eliminated from Further Analysis

During the design of the Proposed Action, several pipeline alternatives were considered by the applicant and the BLM. The alternatives considered included pipeline routes located outside the existing ROW that further avoided the ephemeral protection area indicated in Figure 2. These alternatives were eliminated from further analysis because they would have larger areas of surface disturbance and rock blasting, as well as associated paleontological and cultural resource impacts than the Proposed Action.

3. Affected Environment

3.1 Introduction

This chapter presents the existing environment (i.e., the physical, biological, social, and economic values and resources) of the project area that has the potential for environmental consequences, as identified in the issue statements in Section 1.7. This chapter provides the baseline for comparison of effects and consequences described in Chapter 4.

3.2 General Setting

As described earlier, the project area includes the location of the well pad, access road, and pipeline corridor on private and BLM land, as shown in Figure 2. The project area is in Montezuma County in an area of canyons, plateaus, and piñon-juniper woodlands. The well pad is located on private land on inactive agricultural lands. The adjacent BLM lands consist of a mix of piñon-juniper woodlands and sage grassland vegetation types.

3.3 Resources/Issues Brought Forward for Analysis

3.3.1 Greenhouse Gases

According to the U.S. Global Change Research Program (2009), global warming is unequivocal, and the global warming that has occurred over the past 50 years is primarily human-caused. Standardized protocols designed to measure factors that may contribute to climate change and quantify climatic impacts are presently unavailable. Moreover, specific levels of significance have not yet been established by regulatory agencies. Predicting the degree of impact any single emitter of greenhouse gases (GHGs) may have on global climate or on the changes to biotic and abiotic systems that accompany climate change is highly complex, has considerable uncertainty, and requires intense computer modeling (i.e., super computers). As such, no readily available tools exist to predict impacts a project's emissions would have on the global, regional, or local climate. This analysis is therefore limited to comparing the context of total project GHG emissions, and to emissions recently analyzed by Environmental Protection Agency.

3.3.2 Cultural Resources

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 the present. It was intensely occupied by Ancestral Puebloan people between AD 675 and AD 1290. The Ancestral Puebloans were agricultural people who built settlements on the mesas and in 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 during the 1,300 years of occupation. Surveys suggest intensive occupation of the Project Area in the Basketmaker III, Pueblo II, and Pueblo III periods. During the Basketmaker III period, Ancestral Puebloans built single and multiple pit house settlements on deep soils in the

center of the mesa. During the Pueblo II period, Ancestral Puebloans built single or multiple habitation units composed of masonry and adobe surface rooms and kivas that were also situated on deep soils of the mesa centers. During the last century of the occupation in the Pueblo III period, Ancestral Puebloans built large villages made of masonry situated away from the mesa centers near spring sources at the heads of canyons.

Prior to its designation as a National Monument, CANM was known as the Anasazi Culture Multiple Use Area (ACMUA) – Area of Critical Environmental Concern (–ACEC). The ACMUA was designated on October 2, 1985 in the San Juan/San Miguel RMP based on 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 management plan. Subsequent site or area-specific management plans have also been developed and implemented within the ACEC prior to establishment of CANM. The Presidential Proclamation that established CANM states, "the Secretary of the Interior shall manage the 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 this proclamation."

Archaeologists from Woods Canyon Archeological Consultants (Woods Canyon; BLM permit BLM-C-39470) conducted a cultural resource inventory for the BLM for this project (Robinson, Fetterman, and Shanks 2013). Prior to field surveys, a records search was undertaken at both CANM headquarters and the State of Colorado Office of Archaeology and Historic Preservation in order to identify previously recorded sites within and in proximity to the Project Area. Results of this records review, along with results of the field inventory, are documented in the field survey report (Robinson, Fetterman, and Shanks 2013). A general summary of these results and the archaeological methods utilized are presented below, though specific details are not disclosed due to Federal regulation (43 CFR 7.18 - Confidentiality of archaeological resource information).

3.3.2.1 Archaeological Methodology

The area inventoried for the proposed well and pipeline included 40 acres surrounding the well pad and a 660-foot width along the entire proposed pipeline corridor. The entire Area of Potential Effect (APE; 130 acres surveyed for the 12.3 acre project) received a literature review and new, intensive pedestrian inventory specifically for this project during summer of 2013 by a crew of Woods Canyon archaeologists walking transects no more than 50 feet apart. Much of this area was also previously inventoried for the previous development in CANM and the results are documented in Fetterman and Honeycutt, 1987 and Whitten et.al. 1986.

3.3.2.2 Archaeological Results

Thirty-four sites were identified in the survey area, of which 12 had been previously documented. Twenty-seven of the sites are recommended as eligible, two are recommended as requiring additional data for assessment, and five are recommended as not eligible to the

National Register of Historic Places (36 CFR 60.4). A summary of the number of sites found in the survey areas for respective project components is provided below (Table 4).

Table 4. Number of cultural resource sites within each survey area.

Survey Area	Sites in Survey Area
Well pad Survey Area	7
Pipeline Survey Corridor	31

Cultural surveys conducted for the currently proposed undertaking suggest that the immediate project vicinity was most intensively utilized during the first half of the Ancestral Puebloan occupation with both Basketmaker III and Pueblo I communities identified. Of particular interest is the identification of a transitional Pueblo I/II community in the area.

Local evidence indicates that during the Basketmaker III period, Ancestral Puebloans constructed and occupied single- and multiple-pithouse settlements on the deep soils of the mesa tops or in the valley floor. During the subsequent Pueblo I period, Ancestral Puebloans occupied large multiple pithouse villages either on the mesa top or smaller single pithouse in the canyons. During the Pueblo II and Pueblo III period, Ancestral Puebloans built single or multiple habitation units composed of masonry and adobe surface rooms and kivas set back from prime agricultural ground.

3.3.3 Native American Religious and Other Concerns

CANM consults with 25 tribes (listed below) that have traditional ties to CANM's landscape or are culturally affiliated to the Ancestral Puebloan culture group.

1. Pueblo of Acoma
2. Pueblo de Cochiti
3. The Hopi Tribe
4. Pueblo of Isleta
5. Pueblo of Jemez
6. Jicarilla Apache Nation
7. Pueblo of Laguna
8. Pueblo of Nambe
9. The Navajo Nation
10. Ute Indian Tribe of the Uintah and Ouray Reservation
11. Picuris Pueblo
12. Pueblo of Pojoaque

13. Pueblo of San Felipe
14. Pueblo of San Ildefonso
15. Ohkay Owingeh
16. Pueblo of Sandia
17. Pueblo of Santa Ana
18. Pueblo of Santa Clara
19. Kewa Pueblo
20. Pueblo of Taos
21. Pueblo of Tesuque
22. Ute Mountain Ute Tribe
23. The Southern Ute Indian Tribe
24. Pueblo of Zia
25. The Zuni Tribe of the Zuni Reservation

The Tribes, like all members of the public, are given opportunities to review the BLM's online NEPA Register (http://www.blm.gov/co/st/en/BLM_Information/nepa/TRFO_NEPA.html). The proposed project has been listed on this register since May 23, 2014. In addition, tribal consultation on this project was conducted in person on September 9-10, 2014.

3.3.4 Visual Resources

The proposed project area is located in existing agricultural fields and cleared areas. The proposed pipeline would cross piñon-juniper woodlands to the existing HF Cluster facility on BLM managed land. The proposed pipeline would be installed in an existing pipeline ROW that has been reclaimed but is still visible on the surface. Figure 3 shows the aerial topography and existing land status for the project area, with the disturbance from the previous pipeline work clearly visible from the aerial photo.

The project area locations in CANM are in Visual Resource Management Class II as defined in the RMP (BLM 2010). The project area is traversed occasionally by hunters and other recreational users to access undeveloped areas of CANM.

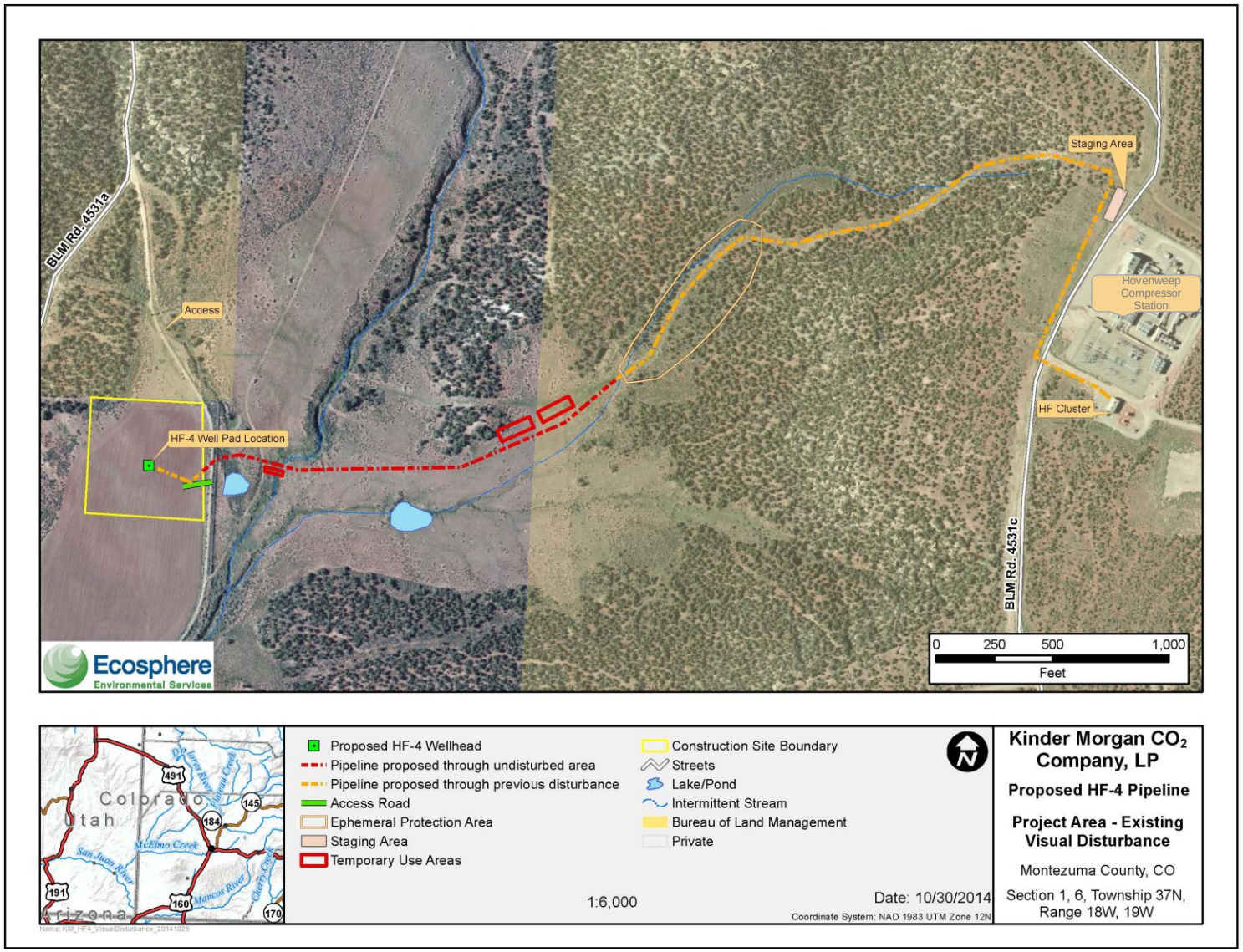

Figure 3. HF-4 Existing Visual Disturbance, Aerial Photo

4. Environmental Effects

4.1 Introduction

This section describes the potential environmental effects of the No Action and the Proposed Action alternatives on the physical, biological, and other resources in the project area described in Chapter 3. Applicant-committed Design Features are described by the operator in the APD (see Appendix C) and are analyzed as part of the Proposed Action. The BLM will apply COAs (listed in Appendix A) as necessary as mitigation measures.

4.2 General Analysis Assumptions and Guidelines

In accordance with 40 CFR 1502.16, potential environmental effects are discussed in this Chapter for each resource for the No Action and the Proposed Action alternatives. Effects may be beneficial or adverse, may be a primary result (direct) or secondary result (indirect) of an action, and may be short-term, long-term or permanent. The Council on Environmental Quality (CEQ) regulations (40 CFR 1500-1508) defines the effects that must be addressed and considered by federal agencies in satisfying the requirements of the NEPA process.

The environmental analysis was completed utilizing existing resource information and on-the-ground field surveys completed in 2013 and 2014. Effects may vary in degree from a slight discernible change to a total change in the environment. Unless specifically described, short-term effects are defined as those lasting 5 years or less and long-term effects last more than 5 years.

4.3 Direct and Indirect Effects

Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.

4.3.1 Alternative A – No Action

This section analyzes the direct and indirect effects of the No Action alternative to the resources described in Chapter 3: Affected Environment. The No Action alternative would result if BLM denied the Sundry application and the proposed pipeline would not be developed as proposed. The well pad and well could be developed as proposed because it is located on private land, and developing private minerals with approved Montezuma County permits for the surface development and lease for minerals. However, any pipeline for that well location would have to go through BLM land, so it is assumed that the well would not be drilled until there is an approved pipeline permit.

4.3.1.1 Greenhouse Gases

The proposed action elements would not be authorized and therefore none of the potential emissions would occur. The incremental increase to global greenhouse gas (GHG) burden would not happen; however, it is entirely likely the predicted climatic changes would occur regardless.

4.3.1.2 Cultural Resources

No new impacts would occur under the No Action alternative.

4.3.1.3 Native American Religious and Other Concerns

No Native American religious concerns regarding the proposed project were expressed verbally or in writing and no new impacts would occur under this Alternative.

4.3.1.4 Visual Resources

Under the No Action alternative, no new project-related effects to visual resources would occur. Existing visual disturbances in the project area including the well pad, pipeline ROW, and HF Cluster facility as described in the Chapter 3: Affected Environment would remain undisturbed.

4.3.2 Alternative B – Proposed Action

This section analyzes the direct and indirect effects of the Proposed Action to the resources described in Chapter 3: Affected Environment.

4.3.2.1 Greenhouse Gases

Greenhouse gas emission estimates for the Proposed Action are included in Appendix B and summarized in Table 5. The emissions estimate considered reasonably foreseeable development activities for the proposed CO_2 well and includes CO_2, methane, and nitrous oxide emissions from both construction and production operations. The inventory was developed using reasonable but conservative scenarios for each activity.

Table 5. Estimated Maximum Greenhouse Gas Annual Emissions (2014) from Proposed Action

Project Emissions (tons)				
Construction	**GHGs**			
	CO_2	**CH4**	**N2O**	**CO_2(e)**
Construction Activities	130.98	0.00	0.00	132.15
Rig and Drilling Operations	161.37	2.06	0.41	332.59
Completion	0.00	0.00	0.00	0.00
Initial Reclamation	97.41	0.00	0.00	98.28
Sub-total: Construction	**389.77**	**2.07**	**0.42**	**563.02**
Operations	**GHGs**			
	CO_2	**CH4**	**N2O**	**CO_2(e)**
On-Road Mobile	3.25	0.00	0.00	3.28
Off-Road Mobile	10.77	0.00	0.00	10.86
Non-Road Portable	1.25	0.00	0.00	1.38
Heaters	0.00	0.00	0.00	0.00
Stationary Engines / Pumps	0.00	0.00	0.00	0.00
Flares / Control Equipment	0.00	0.00	0.00	0.00
Flares / Blowdowns	0.00	0.00	0.00	0.00
Workovers - Re-completions	0.00	0.00	0.00	0.53
Flares / Workovers - Re-completions	0.00	0.00	0.00	0.00
Sub-total: Operations	**15.28**	**0.00**	**0.00**	**16.06**
Total Emissions	**405.05**	**2.07**	**0.42**	**579.07**
Source: Kinder Morgan data using BLM Emissions App 3.0				

Notes: CO_2= Carbon Dioxide; CH4 = methane; CO_2e = carbon dioxide equivalent;
GHG = greenhouse gases; N2O = nitrogen dioxide

The implementation of the Proposed Action Alternative is estimated to contribute 579 tons of carbon dioxide equivalent (CO_2(e)) in the maximum year (2014). Annual operating GHG emissions are estimated to be about 3% of the total emissions shown for the maximum year. Over a 20 year project timeframe, the total GHG emissions expected are approximately 11,580 tons.

This emissions estimate does not account for the ultimate use or consumption of any produced minerals at this time due to the fact that the ultimate form of use cannot be predicted with any

reasonable certainty.

In 2007, the State of Colorado's GHG emissions were 124,000,000 metric tons. The proposed action's GHG emissions represent a fraction of a percentage of the state of Colorado's GHG emissions on a maximum annual basis as shown in Table 6.

To provide additional context, the EPA has recently modeled global climate change impacts from a model source emitting 20% more GHGs than a 1500MW coal-fired steam electric generating plant (approx. 14,132,586 metric tons per year of CO_2, 273.6 metric tons per year of nitrous oxide, and 136.8 metric tons per year of methane). EPA estimated a hypothetical maximum mean global temperature value increase resulting from such a project. The results ranged from 0.00022 and 0.00035 degrees Celsius occurring approximately 50 years after the facility begins operation. The modeled changes are extremely small, and any downsizing of these results from the global scale would produce greater uncertainty in the predictions. The EPA concluded that even assuming such an increase in temperature could be downscaled to a particular location, it "would be too small to physically measure or detect." (EPA 2008).

This project's emissions are a fraction of the EPA's modeled source and are shorter in duration, and therefore it is reasonable to conclude that the project would have no measurable climate change impacts.

Table 6. Greenhouse Gas Emission Comparisons

Inventory Description	CO_2e Emissions (million metric tons per year)	Proposed Action Percentage
Colorado (2007)	124	0.0005%
Total US Greenhouse Gases	6,957	0.00003%

Source: USEPA 2010

4.3.2.2 Cultural Resources

From its inception, the Proposed Project was designed to avoid sites recommended as eligible or potentially eligible (e.g. "needs data") for the National Register of Historic Places. The proposed well pad and pipeline were configured to physically avoid all archaeological sites within the Area of Potential Effect. One site (5MT8372) will require fencing and additional monitoring throughout the construction phase of the project due to that site's proximity to the proposed actions. Additionally, all proposed ground-disturbing activity will be monitored by a BLM or BLM-permitted archaeologist with the standard terms to halt work should any discoveries be made.

The current project has been intentionally located mostly (79%) within areas previously disturbed by either the private landowner or by previously-permitted projects. The current

project proposes new disturbance to approximately 2.6 total acres of the approximately 174,000 acre CANM cultural landscape, or 0.001%, as managed by the BLM as part of CANM.

Therefore, it was the determination of the BLM (in an informational letter to the SHPO on 10/24/2013) that the Federal actions proposed by Alternative B would not adversely affect cultural resources. Measures necessary to ensure this have been incorporated into the SUPO design features (Appendix C) and Conditions of Approval (Appendix A), and include personnel education, construction monitoring, placement of avoidance fences, and inadvertent discovery procedures.

4.3.2.3 Native American Religious or Other Concerns

No Native American religious or other concerns regarding the proposed project were expressed verbally or in writing. Project COAs (see Appendix A) that have been developed through previous Tribal consultation are reiterated and have been incorporated into the SUPO and project design features.

4.3.2.4 Visual Resources

Under the Proposed Action short term impacts to visual resources would occur with the fresh ground disturbance associated with the pipeline installation. However, the disturbance would be located within an existing pipeline ROW and would not create any new contrasts to the form, line, color, or textural elements to the characteristic landscape. The project would meet VRM Class II objectives (it would retain the existing character of the landscape and would not attract the attention of the casual observer).

4.4 Cumulative Effects

As defined in CEQ regulations (40 CFR 1508.7), cumulative effects include direct and indirect effects likely to occur as a result of implementation of the Proposed Action in combination with direct and indirect effects of past actions, other ongoing activities in the area, recently constructed projects in the area, and projects that would likely be implemented in the area in the near future. If there are no direct or indirect effects to a resource for the Proposed Action, then no cumulative effects analysis is needed for the resource.

The geographic area considered in the cumulative effects analysis needs to be sufficient to capture potential effects from the Proposed Action that could combine with on-going or future actions to create impacts to environmental resources. Unless otherwise specified, the geographic scope of the cumulative analysis is defined by the boundaries of the McElmo Dome Unit and as shown in Figure 4. This area encompasses most of CANM as well as surrounding private lands and would capture cumulative effects that could have landscape scale effects.

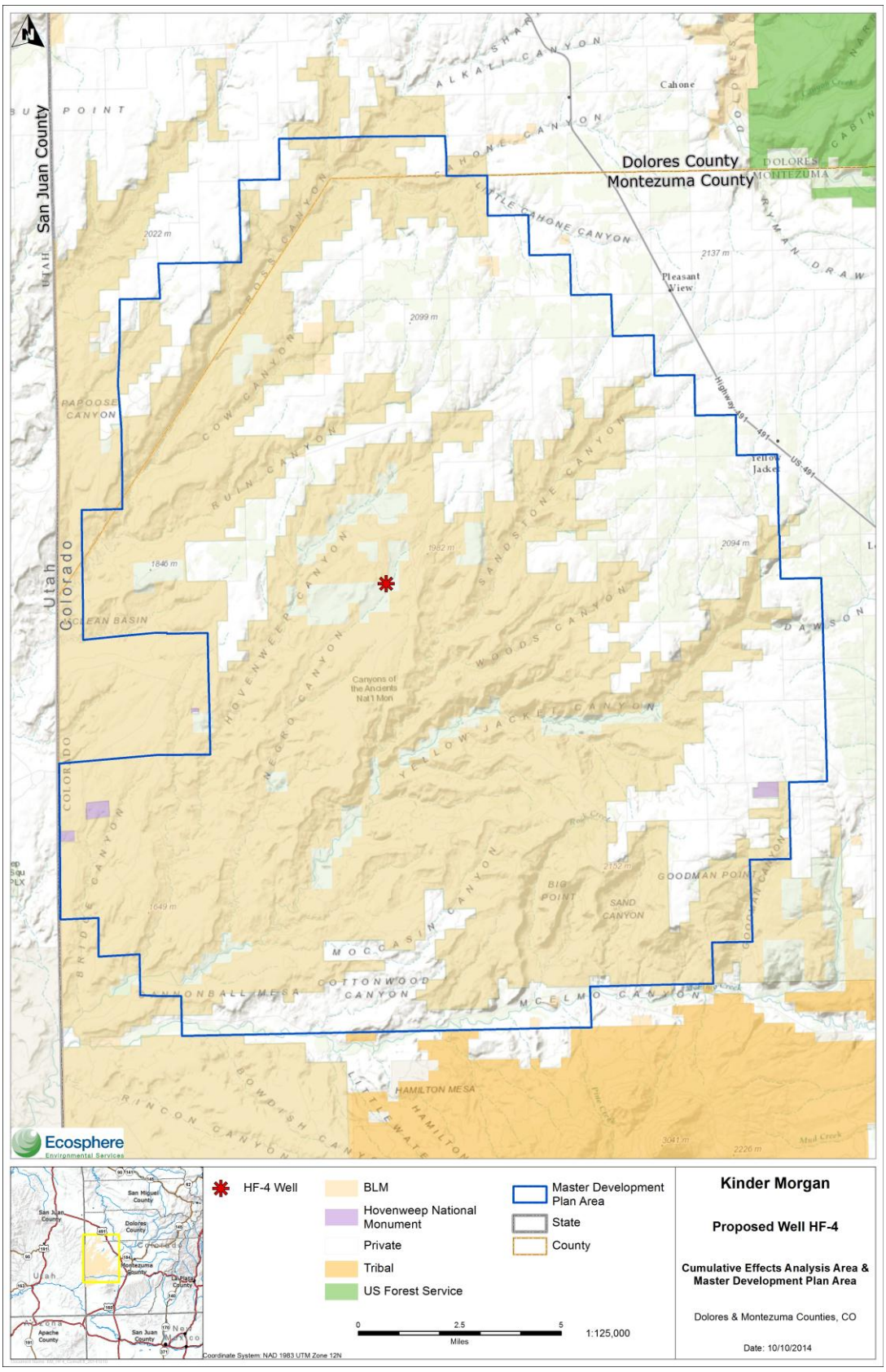

Figure 4. Cumulative Effects Analysis Area

4.4.1 Past, Present, and Reasonably Foreseeable Future Actions

The project area is located in a relatively undeveloped region of Montezuma County. Based on the reasonably foreseeable development (RFD) scenario included in the RMP (BLM 2010), the primary past, ongoing, and foreseeable future actions that would contribute to potential cumulative effects include:

- Fluid Mineral Development – Proposals have been submitted for a new lateral on the existing YG2 CO_2 well (with no new surface disturbance), a new split-estate CO_2 well named CD-3 (with about 13 acres of new disturbance, 12 acres would be reclaimed immediately), and a pipeline for the existing Sand Canyon 5 CO_2 well (with about 15.5 acres of new disturbance, 13 acres would be reclaimed immediately). In addition, BLM started the process for the Yellow Jacket Geographic Area Development Plan, which would analyze about 5 years of Kinder Morgan CO_2 development in the Yellow Jacket area of the McElmo Dome Unit. The RMP/FEIS for CANM considers cumulative disturbance of 3,150 acres for past, present, and future development, including 353 acres for well pads and pipelines (BLM 2010). The Proposed Action and forseeable fluid minerals development falls within the scope of the fluid mineral development that was assessed in the cumulative impacts analysis for the RMP/FEIS.

  According to COGCC statistics there were approximately 189 active wells in Montezuma County in 2014. Most of these wells are producing CO_2. (COGCC 2014). Since the RMP was approved in 2010, the number of new well permits in Montezuma County has increased from 3 per year to 12 per year. The majority of this development is occurring on privately owned surface locations. While the rate of new well development has increased since 2010, it is consistent with the RFD scenario used in the RMP/FEIS.
- BLM Permit Renewals – BLM is considering renewals for various Lands and Realty Rights Of Way and grazing permits within the Cumulative Effects Analysis Area. No new surface disturbance would be necessary for these renewals.
- Recreation – There are currently 41,000 annual recreational visitors to CANM, and growth in use is expected to increase at a rate similar to general population growth in the region.
- Residential and Other Development on Agricultural Lands – Land use on the private land surrounding and within CANM is primarily large scale agricultural or conservation reserve. With increased population in the region, these lands are slowly being converted from agricultural to rural residential land use. This land use change is regulated through the Montezuma County Comprehensive Plan and Dolores County Master Plan. This development as well as land use changes associated with fluid mineral development must be approved through a public planning process that includes consideration by the County Planning Commission and final approval in a public hearing by the Board of County Commissioners. These county planning processes ensure that the land use changes are

consistent with county planning and that the public is notified and can contribute to the planning process.

- Vegetation Changes – Vegetation changes and treatments include continued risk of large-scale wild fires, and continued drought and die-off of piñon and juniper trees.

4.4.1.1 Alternative B – Cumulative Effects

The Proposed Action includes Design Features that would reduce or eliminate direct or indirect effects. Furthermore, BLM has included a set of COAs (Appendix A) that must be met during construction, operation, and reclamation of the project.

No direct or indirect effects to Native American Religious or Other Concerns are anticipated as a result of the Proposed Action, so there would be no cumulative effects to those resources.

The resources below are analyzed in more detail because of the potential for direct or indirect effects to result in cumulative effects with past, on-going or reasonably foreseeable future actions. Overall, there would be no significant cumulative effects for the Proposed Action.

4.4.1.2 Cumulative Effects to Cultural Resources

Approximately 31.1 acres of new disturbance are proposed for fluid minerals projects in the Cumulative Effects Analysis Area. This is approximately 0.02% of the approximately 203,000-acre McElmo Dome Unit. The potential direct and indirect effects to cultural resources associated with the Proposed Action and other forseeable fluid minerals development would be the risk of disturbance or damage to inadvertent discoveries of cultural resources. This risk is considered in the RMP/FEIS and found to have no significant cumulative impacts for the reasonable foreseeable development considered which includes the Proposed Action.

Rather than attempt to address these secondary effects to setting and landscape at this infinitesimal scale, the agency, the Colorado State Historic Preservation Officer (SHPO), the President's Advisory Council on Historic Preservation and KM are currently programmatically assessing and addressing the effects of both historical (i.e. previously permitted) and future oil and gas development to this larger cultural landscape as part of the ongoing Master Development Plan process for the McElmo Dome CO_2 Development.

4.4.1.3 Cumulative Effects to Visual Resources

Past activities associated with fluid mineral exploration and agricultural development has resulted in a landscape pitted and crisscrossed by partially healed disturbances which have primarily affected the vegetative component of the area. Currently active and "abandoned" well pads and exploration routes have created openings and edges in the vegetation that have not been fully reabsorbed by trees and shrubs. Current use of some of these same features by recreational users (driving and hunting) and grazing operations have kept some of these areas (roads, primarily) clear of all vegetation. Current use for agriculture and conservation protection on private lands has resulted in large cleared areas with crops and tilled soil. Future development associated with fluid mineral development, vegetation changes and treatments, and increased use

of linear disturbances (roads, primitive roads, exploration routes) by recreational and other pursuits would likely increase the evidence and noticeability of vegetative openings and edges.

The Proposed Action would incrementally contribute to these cumulative effects through increased use and maintenance of existing roads and primitive roads. Additionally, the existing, partially reclaimed pipeline ROW would be disturbed, redefining the vegetative edge effect. However, the design features and COAs which minimize new disturbance and maximize the utilization of existing disturbance greatly reduce visual impacts both directly and cumulatively to the landscape.

4.4.1.4 Cumulative Effects to Greenhouse Gas Emissions and projected Climate Change

The Cumulative Effects Analysis Area for Greenhouse Gas emissions and Climate Change is the the Southwest region cumulative impact area defined in the National Climate Assessment (GCCRP 2014). With respect to cumulative Greenhouse Gas emissions and the associated projected Climate Change impacts, the following predictions were identified in the National Climate Assessment:

- The Southwest is already experiencing the impacts of climate change. The region has heated up markedly in recent decades, and the period since 1950 has been hotter than any comparably long period in at least 600 years. The decade 2001-2010 was the warmest in the 110-year instrumental record, with temperatures almost 2°F higher than historic averages, with fewer cold air outbreaks and more heat waves.
- There is mounting evidence that the combination of human-caused temperature increases and recent drought has influenced widespread tree mortality, increased fire occurrence and area burned, and forest insect outbreaks. Human-caused temperature increases and drought have also caused earlier spring snowmelt and shifted runoff to earlier in the year.
- Southwest regional annual average temperatures are projected to rise by 2.5°F to 5.5°F by 2041-2070 and by 5.5°F to 9.5°F by 2070-2099 with continued growth in global emissions, with the greatest increases in the summer and fall. If global emissions are substantially reduced, projected temperature increases are 2.5°F to 4.5°F (2041-2070), and 3.5°F to 5.5°F (2070-2099).
- Summertime heat waves are projected to become longer and hotter, whereas the trend of decreasing wintertime cold air outbreaks is projected to continue. These changes will directly affect urban public health through increased risk of heat stress, and urban infrastructure through increased risk of disruptions to electric power generation. Rising temperatures also have direct impacts on crop yields and productivity of key regional crops, such as fruit trees.
- The Southwest is prone to drought. Southwest paleoclimate records show severe mega-droughts at least 50 years long. Future droughts are projected to be substantially hotter, and for major river basins such as the Colorado River Basin, drought is projected to become more frequent, intense, and longer lasting than in the historical record. These

drought conditions present a huge challenge for regional management of water resources and natural hazards such as wildfire.

Overall the greenhouse gas emissions associated with the Proposed Action would have a negligible contribution to state and natural greenhouse gas emissions. Climate change trends, particularly increased drought and summer heat could make reclamation of pipeline ROW more difficult. However, the project design features and COAs would ensure that reclamation efforts are monitored and completed sufficiently to match existing conditions in the area.

4.5 Residual Effects

If the Proposed Action is approved and the well is determined to be productive, the CO_2 gas would be extracted. The gas generated from the project would be transported to out-of-state markets. Because the gas would not regenerate, the extraction would be an irreversible commitment.

5. Consultation and Coordination

5.1 Introduction

As described in Sections 1.7, 5.2 and 5.3, BLM specialists, agency and public scoping were used to identify those issues analyzed in detail in Chapters 3 and 4, and provide the rationale for issues that were considered but not analyzed further.

5.2 Persons, Groups, and Agencies Consulted

The following persons provided information on resource concerns and project design descriptions.

Table 7. List of all Persons, Agencies and Organizations Consulted for Purposes of this EA

Name	Purpose & Authorities for Consultation or Coordination
Brian Magee	Land Use Coordinator, Colorado Parks and Wildlife
Dave Kubezcko	Colorado Oil and Gas Conservation Commission – Oil and Gas Location Assessment
Andy Antipas	Kinder Morgan CO_2 Company, Permitting
Montezuma County Board of County Commissioners	County High Impact and Special Use Permit for original well pad

5.3 Summary of Public Participation

During preparation of the EA, the public was notified of the Proposed Action by posting on the BLM Tres Rios Field Office's NEPA Register (http://www.blm.gov/co/st/en/BLM_Information/nepa/TRFO_NEPA.html). The Proposed Action was posted on May 23, 2014. A letter soliciting scoping comments on the proposed project was sent to stakeholders and published in the NEPA register. A public scoping period was held from June 6, 2014 until July 6, 2014, and three comments were received. The scoping comments included support due to the economic benefits of CO_2 development and rights of private landowners to accept development on their lands, support due to trust that Kinder Morgan will conduct environmentally responsible operations, concern for cultural resource protection, and questions about "piecemeal" development and connected actions.

5.4 List of Preparers

This EA was prepared by Ecosphere Environmental Services, Inc. (Ecosphere) according to direction from BLM staff. The following agency employees participated on the interdisciplinary team, reviewed and edited the EA.

Table 8. List of BLM Preparers

Name	Title	Responsible for the Following Resources
Tracy Perfors	Natural Resource Specialist	Project Manager
Chad Meister	Natural Resource Specialist	Air
Vince MacMillan	Archaeologist	Cultural
Kelly Palmer	Hydrologist	Farmlands, Floodplains; Soils; Water Resources/Quality
Nathaniel West	Wildlife Biologist	Wildlife; Migratory Birds; Special Status Animal Species; Threatened, Endangered or Candidate Animal Species; Wetlands
Mike Jensen	Botanist	Invasive Species/Noxious Weeds; Rangeland; Special Status Plant Species; Threatened, Endangered or Candidate Plant Species; Vegetation
Martin Hensley	Economist	Environmental Justice; Socio-Economics
Brad Pietruszka	Fire Management Specialist	Fuels/Fire Management
Harrison Griffin	Realty Specialist	Lands/Access
Jeff Christenson	Outdoor Recreation Planner	Lands with Wilderness Characteristics; Recreation; Visual; Wild and Scenic Rivers; Wilderness/Wilderness Study Areas
Jamie Blair	Geologist and Paleontology program coordinator	Paleontology
Gina Jones	NEPA Coordinator	NEPA Compliance

Table 9. Non-BLM Preparers

Name	Title and Company	Responsible for the Following Section(s) of this Document
Keith Fox	Project Coordinator, Ecosphere	Project Manager
Carolyn Dunmire	Resource Economist, Ecosphere	Socioeconomics and Environmental Justice. Air Emissions Inventory, and Climate Change.
Aimee Way	Wildlife Biologist, Ecosphere	Assistant Project Manager, Chapters 1 and 2; Migratory Birds; Threatened, Endangered and Candidate Animal Species; Visual Resources
Hondo Brisbin	Botanist, Ecosphere	Vegetation; Threatened, Endangered and Candidate Plant Species
Matthew Smith	Ecologist, Ecosphere	Cultural Resources; Recreation; Paleontology; Soils; Water Resources and Quality
Laura Getts	GIS Specialist, Ecosphere	Visual Resources
Jerry Fetterman	Woods Canyon	Cultural
Marcie Ryan	Paleontologist, Western Slope Paleontological Services, Ltd.	Paleontology

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Appendix A: BLM Conditions of Approval

BLM Conditions of Approval (COA)

These Conditions of Approval are required on BLM surface and recommended on private surface. Exceptions or waivers from these COA are only granted with written permission from the BLM Tres Rios Field Office Natural Resource Specialist (NRS) —Tracy Perfors at (970) 882-6856.

1) The operator is required to follow the surface protections in the HF4 Surface Use Plan of Operations (SUPO) and permit Conditions of Approval (COA). A copy of the approved permit, Surface Use Plan, and COA's should be on site during construction and drilling. In the event of a conflict, these COA take precedence over any or all terms and conditions set forth in the SUPO.
2) To clarify the potential contradiction in the Surface Use Plan, 1B, which states "Existing access will be maintained in as good or better condition than presently exists. The maintenance program will include (but not be limited to) ditch and road surface blading/maintenance, culvert maintenance, and installing additional drainage turnouts if needed." and 2A, which states, "No new roads need to be constructed, the project will utilize the existing road, well pad, and pipeline, and no new surface disturbance is needed.": No new surface disturbance is authorized, to include construction or maintenance of stormwater controls, beyond the existing borrow ditch of the access road on BLM land.
3) The operator will apply water, gravel, or other mitigation such that no visible dust plumes are observable leaving the well pad, road and pipeline ROW.
4) No surface disturbing activity will be allowed within ½ mile of documented active raptor nests from February 1 through July 31, annually, prior to a raptor nest occupancy survey for the current breeding season. This timing limitation applies to construction, drilling, completions operations, placing of production equipment, and associated infrastructure to include roads, pipelines, power lines, etc. This timing restrict may be modified the BLM TRFO Wildlife Biologist. (This is a modification of, which supersedes, Design Criteria #31 from the operator's Surface Use Plan).
5) No surface disturbing activity will be allowed May 1 through June 30, annually, to protect nesting migratory birds during the peak breeding season. Clearance surveys may be conducted with coordination from the BLM TRFO Wildlife Biologist. (This is a modification of, which supersedes, Design Criteria #32 from the operator's Surface Use Plan).
6) Site 5MT8372 will be flagged and monitored by a BLM or BLM-permitted archaeologist as described in Design Feature #25.
7) The operator shall immediately notify the BLM authorized officer of any paleontological resources discovered as a result of operations under this authorization. Appropriate measures to mitigate adverse effects to significant paleontological resources will be determined by the authorized officer after consulting with the operator. The operator is responsible for the cost

of any investigation necessary for the evaluation and for any mitigation measures. The operator may not be required to suspend operations if activities can avoid further impacts to a discovered site or be continued elsewhere, however, the discovery shall be brought to the attention of the authorized officer as soon as possible and protected from damage or looting.

8) To the extent practicable, the operator will minimize vegetation clearing and dirt work in the staging area and temporary use areas. For all disturbed areas, reclamation is required, following the same methods and standards in the operator's Surface Use Plan design criteria #38, 39, 41-48.
9) The only project activities allowed in the Ephemeral Drainage Protection Area identified in Figure 2: Project Area Map are the construction of storm water BMPs and engineered erosion control measures included in the storm water management plan and design features. No trees will be cut down. Any additional construction activities or measures must be approved by the authorized officer prior to implementation or construction.

Appendix B: Emissions Inventory

Project Emissions (tons)

Activity	Criteria Pollutants						GHGs				HAPs
Construction	**PM10**	**PM2.5**	**VOC**	**NOx**	**CO**	**SO2**	**CO_2**	**CH4**	**N2O**	**CO_2e**	**All**
Construction Activities	1.94	0.36	0.10	0.66	0.81	0.02	130.98	0.00	0.00	132.15	0.00
Rig & Drilling Ops	0.27	0.07	0.07	1.26	0.75	0.04	161.37	2.06	0.41	332.59	0.00
Completion	0.21	0.03		0.19	0.20	0.01			0.00		
Initial Reclamation	1.25	0.24	0.08	0.49	0.60	0.01	97.41	0.00	0.00	98.28	0.00
Sub-total: Construction	**3.67**	**0.70**	**0.25**	**2.60**	**2.37**	**0.08**	**389.77**	**2.07**	**0.42**	**563.02**	**0.00**
Operations											
Fugitive Dust	1.07	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA
On-Road Mobile	0.00	0.00	0.00	0.01	0.04	0.00	3.25	0.00	0.00	3.28	0.00
Off-Road Mobile	0.01	0.01	0.01	0.08	0.04	0.00	10.77	0.00	0.00	10.86	0.00
Non-Road Portable	0.00	0.00	0.00	0.01	0.01	0.00	1.25	0.00	0.00	1.38	0.00
Tanks	NA	NA	0.00	NA	NA	NA	NA	NA	NA	NA	0.00
Tank (liquids) Loadouts	NA	NA	0.00	NA	NA	NA	NA	NA	NA	NA	0.00
Components	NA	NA	0.00	NA	NA	NA	0.00	NA	NA	NA	0.00
Pneumatic Devices	NA	NA	0.00	NA	NA	NA	0.00	NA	NA	NA	0.00
Heaters	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stationary Engines / Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Engine / Compression Start-up & Shutdown	NA	NA		NA	NA	NA	NA	NA	NA	NA	
Dehydration Units	NA	NA		NA	NA	NA	NA	NA	NA	NA	
Flares / Control Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blowdown Venting	NA	NA		NA	NA	NA	0.00	0.00	NA	NA	
Flares / Blowdowns	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Workovers - Re-completions	0.10	0.02		0.10	0.10	0.00	0.00	0.00	0.00	0.53	0.00
Flares / Workovers - Re-completions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Operations	**1.18**	**0.21**	**0.01**	**0.20**	**0.18**	**0.01**	**15.28**	**0.00**	**0.00**	**16.06**	**0.00**
Sub-total: General Conformity	NA	NA	**0.26**	**2.80**	NA	NA	NA	NA	NA	NA	NA
Total Emissions	**4.85**	**0.91**	**0.26**	**2.80**	**2.55**	**0.08**	**405.05**	**2.07**	**0.42**	**579.07**	**0.00**

Appendix C: Surface Use Plan of Operations

Attachment A

Surface Use Plan of Operations

Hovenweep HF-4 Well Pad, Associated Road, and Well-tie Pipeline

425' FSL & 2,293' FWL
Section 1 Township 37N Range 19W
Section 6 Township 37N Range 18W
Ground Elevation:6,248

Montezuma County, Colorado

Kinder Morgan CO2 Company, LP (Kinder Morgan)

July 2014

TABLE OF CONTENTS

LIST OF TABLES

ACRONYMS

BMP	best management practice
BLM	Bureau of Land Management
BOPE	Blowout preventer equipment
CDOT	Colorado Department of Transportation
COA	conditions of approval
COGCC	Colorado Oil and Gas Conservation Commission
DF	Design Features
Holder	Permit Holder
Monument	Canyons of the Ancients National Monument

NSO	No Surface Occupancy
ROW	right of way
SUPO	Surface Use Plan of Operations
TRFO	Tres Rios Field Office
WRD	Division of Water Resources

1. PROJECT DESCRIPTION

Kinder Morgan CO2 Company, LP (Kinder Morgan), is proposing to drill a new CO_2 well and construct a new pipeline to connect it to a nearby cluster facility. The proposed project would consist of a new well and pad located on privately owned surface, with a connecting pipeline that crosses into Canyons of the Ancients National Monument (the Monument), which is administered by the BLM Tres Rios Field Office (TRFO). The connecting pipeline would terminate at the HF Cluster Facility located approximately 3,900 feet east of the proposed well pad location. Kinder Morgan submitted an Application for Permit to Drill (APD) to the Colorado Oil and Gas Conservation Commission (COGCC) for the proposed project on August 27, 2013. The APD was approved by COGCC on September 26, 2013. The Sundry Notice to the BLM for the construction of the connecting pipeline on BLM-managed land to the cluster facility was submitted on May 21, 2014.

The proposed well would be located in Montezuma County, Colorado, as shown in the Location Map. The legal coordinates of the proposed well and the lease information are listed in Table 1. The HF-4 well and pad would be located adjacent to the exterior boundary of CANM along its north side and approximately 1,403 feet from the exterior boundary of the Monument on its east side. Upon completion of all permitting and environmental regulatory compliance requirements, the proposed project would begin construction in October 2014 and require approximately five months to complete.

Table 1. Lease summary and legal description for proposed well

Well Name	Mineral Lease	Surface Location (Ownership)	Bottom Hole Location (Mineral Ownership)	Well Depth (Feet)
HF-4	Fee	425 feet from the south line and 2,293 feet from the west line; Section 1, Township 37 North, Range 19 West (Fee)	1,575 feet from the north line and 2,293 feet from the west line; Section 12, Township 37 North, Range 19 West (Fee)	8,330

1.1 Directions to the Project Area

The access route to the wellpad location from United States (U.S.) Hwy 491 is outlined in the Project Map. Use the following driving directions to reach HF-4 from the intersection of Hwy 491 and County Road BB:

1. Travel West on County Road BB for 4 miles.
2. Turn left (south) on County Road 12 for 2 miles.
3. Turn right (west) on County Road Z for 1 mile.
4. Turn left (south) on County Road 11 for 1 mile.
5. Turn right (west) on County Road Y for 1.3 miles.
6. Road then turns left (south) on County Road Y/BLM Road 4531a through several curves for 1.4 miles.
7. Turn left (south) on BLM road 4531 for 1.5 miles to a fork in the road.
8. Stay left at the fork and continue 500 yards to the location access.
9. Proposed access will be on the right (west) side of the road. Location is immediately adjacent to the existing road.

In addition, pipeline construction vehicles will access the pipeline ROW from the well pad (described above), or from BLM road 4531c (described below).

1. From the intersection of Hwy 491 and County Road BB, travel West on County Road BB for 4 miles.
2. Turn left (south) on County Road 12 for 2 miles.
3. Turn right (west) on County Road Z for 1 mile.
4. Turn left (south) on County Road 11 for 1 mile.
5. Turn right (west) on County Road Y for 1.3 miles.
6. Road then turns left (south) on County Road Y/BLM road 4531a through several curves for 1.4 miles.
7. Continue south on BLM road 4531c to the pipeline ROW tie-in at the HF Cluster facility and the Hovenweep Compressor Station.

1.2 New or Reconstructed Access Roads

a) The sections of access road under Montezuma County Road and Bridge jurisdiction will be maintained by Kinder Morgan per agreement with the county and commensurate with Kinder Morgan traffic levels.
b) The maintenance program will include (but not be limited to) ditch and road surface blading/maintenance, ditching, culvert maintenance, and installation of additional drainage turnouts, if needed.
c) Approximately 500 feet of gravel-surfaced access road will be constructed on private land and will be limited to a travel-road width of 18 feet.
d) The access road will be surfaced with 12 inches of gravel. Water or magnesium chloride may be applied to the access road as a dust control measure, depending on weather conditions.
e) Culverts for new roads will be sized and located to allow normal drainage to flow under the roadway and drain roadside ditches.
f) The road will be maintained to be reasonably smooth and free of ruts, soft spots, chuckholes, rocks, slides, and washboard conditions. All-weather surfacing will remain in place if the proposed well becomes a producer. A regular maintenance program will include blading, ditching, sign replacement, surfacing, and culvert maintenance. Maintenance deficiencies on the county road sections will be corrected when documented and directed by the Montezuma County or BLM.
g) Kinder Morgan will adhere to the Montezuma County Road and Bridge Standard Specifications on all county roads, with the following exceptions: for county roads crossing the Monument, road width will be limited to the existing disturbed road width. No widening or removal of vegetation outside the existing road width will be allowed unless authorized in writing by the BLM.

1.3 Location of Existing Wells

a) The HF-4 well is a proposed new drill on a new location.
b) Locations of existing wells within a one-mile radius of the surface location are shown on the Locations of Existing Wells Map. Details of wells located within a 1-mile radius are listed in Table 2.

Table 2. Wells located within 1 mile of proposed HF-4 well

Well Name	Well type and status	Location	Land/Mineral status	Miles from HF-4
McElmo Dome Unit #HF- 3	CO2/Producing	Section 35, T38N, R19W	Federal/Federal	0.66 SE
McElmo Dome Unit 6-37-18 #HF1	CO_2/Producing	Section 6, T37N, R19W	Federal/Federal	0.85 E
McElmo Dome Unit 12—37-19 #HC-1	CO_2/Producing	Section 12, T37N, R 19W	Federal/Federal	0.91 SE
McElmo Dome Unit 12-37-19 #HC-3	CO_2/Producing	Section 12 T37N, R18W	Federal/Federal	0.99 SE
Ampolex Hovenweep #1	Plugged and Abandoned	Section 6, T37N, R18W	Federal/Federal	0.93NE

1.4 Existing and/or Proposed Production Facilities

a) The production facilities proposed to be located on the wellpad include wellhead and pipeline spool section. If produced water is present in the production stream, a glycol skid may be installed at the well location during winter months (November to April) annually. A water pump may be installed at the location if produced water builds up in the CO_2 flowline.
b) Production for this well would occur off the wellpad location. It would be produced into the HF Cluster Facility.
c) The flowline will be constructed within an existing Resolute Energy Corporation pipeline right of way (ROW) for the majority of the route. The proposed flowline will be offset a minimum of 10 feet from the CO2 pipeline.
d) The proposed CO_2 flowline of approximate length of 6,014 feet would be installed underground from the wellhead to the HF cluster facility as shown in the Proposed HF-4 Right of Way and Easement Plat. The pipeline would be a 10-inch carbon steel pipeline with a High Density Polyethylene liner with 50 million cubic feet per day (MMCFD) rating. A 2-inch water line and 2-inch electric conduit line will be installed within the same trench with the flowline. If produced water is an issue with the well, the water line and or conduit may be utilized for production purposes, such as adding an electric pump at the well head.
e) Pipeline construction activities will minimize disturbance to existing soils and vegetation, as much as possible. The proposed pipeline route will be reclaimed immediately following completion of construction activities. Wash crossings and temporary travel for the pipeline route will be constructed per the engineered drawings provided to the BLM. All temporary culverts will be 18 inch corrugated metal pipe.
f) Reclamation activities will include contouring, seeding, and placement of wood litter material across the ROW area. Wood litter material will be worked over so tree trunks are stripped of their branches.

1.5 Source of Fresh Water Supply

a) Water will be trucked in from the Dolores Water Conservancy District (DWCD) canal utilizing Municipal and Industrial shares owned by Kinder Morgan and RW trucking. These are approved DWCD uses and water is reused to the greatest extent possible during other drilling operations. Some of the water used at this location may be reusable water from another Kinder Morgan well

location. RW Trucking will use Kinder Morgan - Montezuma County truck route roads to access the water source.

1.6 Construction Materials

a) Construction material (e.g., gravel, structural stormwater best management practices [BMPs] material, etc.) not available on-site will be hauled to the Project Area from an off-site location. The Four Corners Materials gravel pit, located at 25350 Road N in Cortez, CO is generally the source of material.

1.7 Methods of Handling Waste Material

a) Produced water will be reused at another drill site in connection with this project or hauled to a Kinder Morgan Class I non-hazardous disposal well (MWD-1, HWD-1, HWD-2, YWD-1, or DWD-1).
b) Any produced water containing significant quantities of produced oil will be treated and the oil sold, recycled, or disposed of at Industrial Ecosystems, Inc., a permitted landfarm located at 49 Road 3150, Aztec, NM 87410 or to Agua Moss LLC located at 3782 Provo, Bloomfield, NM 87413.
c) The well area and lease premises will be maintained in a responsible manner with due regard to safety, conservation, and appearance. The solid waste and garbage resulting from drilling operations will be hauled to the Montezuma County landfill, located at 26100 Road F, Cortez, CO 81321.
d) Sewage from on-site sanitary facilities will be stored in an on-site, Montezuma County-approved closed system and then hauled under existing permit to the Town of Dolores Wastewater Treatment Facility, located at 31 Central, Dolores CO 81323.
e) Drilling fluids will be recycled whenever practical, or disposed of as described in a) above. The following will be conducted to accomplish the task of handling the drilling fluids and drill cuttings waste materials:
    i. The free liquids from the closed-loop system will be removed via vacuum truck. The liquids will be hauled for reuse to another drilling location or disposed in a Kinder Morgan disposal well.
    ii. The closed-loop system keeps fresh water cuttings separated from the salt formation and brine water cuttings. The fresh-water cutting contents of the closed loop system will be tested using the Colorado Oil and Gas Conservation Commission (COGCC) procedures. Salt cuttings will also be tested according to COGCC procedures. If they pass the test, all cuttings will be disposed of at the Montezuma County Landfill.
    iii. Estimated number of truck trips required to remove cuttings is between 9 and 35, depending on the amount of salt cuttings produced.
f) Kinder Morgan and its contractors shall ensure that all use, production, storage, transport, and disposal of hazardous materials or hazardous wastes associated with drilling, completion, and production of the well and project operations will be in accordance with all applicable existing or hereafter promulgated federal, state, and local government rules, regulations and guidelines.
g) Spills and leaks will be cleaned up immediately, and contaminated soils will be removed to a permitted disposal site. COGCC spill reporting procedures will be followed.

1.8 Ancillary Facilities

a) Vehicles and equipment may be staged on the production area of nearby Kinder Morgan well pads and facilities during construction and drilling. Vehicles and equipment will be removed within 5 days after completion of construction and drilling.

1.9 Well Site Layout and Pipeline

a) The proposed drilling facility layout diagram shows the location of drilling equipment and topsoil stockpile. Note that the actual drilling facility layout may be different from originally proposed, due to differences in equipment implemented or to give the drilling crew flexibility to respond to changes at the time of well development. The wellpad is estimated to cover an area of 5.6 acres.

   Prior to well pad construction or rigging up, stormwater BMPs will be installed at the well pad in such a manner as to control stormwater runoff and contain spills. Topsoil will be segregated from areas where subsoil materials are stored.

b) The flowline that will connect the well to the production line is estimated to total 6,014 linear feet from wellhead to HF cluster facility. Approximately 4,271 feet of the flowline will be located on Bureau of Land Management (BLM) land and 1,743 feet will be located on private land. (See Attachment D—Right of Way and Easement Plat). The flowline on private land will have a construction corridor width of approximately 50 feet. On BLM land, the ROW width will be limited to the previous disturbance width (approximately 45 feet), except at the following locations: PI 538 and 578. At these locations, the ROW may extend up to 55 feet, an additional 10 feet wider to south of the ROW alignment. There will be a staging area located on the east end of the pipeline route, adjacent to BLM road 4531c at approximately PI 587 and a temporary use area will be located on BLM land at approximately PI 537, as shown on Attachment G. Two temporary use areas would be located on private land. The staging area and each temporary use area will be approximately 7,500 square feet (150 feet long by 50 feet wide).

c) The approximate disturbance for the entire project would be 5.6 acres for the well pad, 0.5 acre for the access road, 5.5 acres for the pipeline, and 0.7 acre for the staging area and temporary use areas. Total disturbance would be 12.3 acres.

1.10 Interim and Final Reclamation

a) The proposed production facility layout interim reclamation areas are show in the Interim Reclamation Area Map. The total wellpad area is 5.6 acres located on private land. The un-reclaimed area that will have gravel surface during production is approximately 0.61 acres.
b) If production is established, unused portions of the wellpad will be re-contoured, topsoil spread, and reseeded.
c) Stockpiled topsoil will be spread evenly over the areas designated for restoration.

d) Stormwater control for construction and long-term operation will be in accordance with Kinder Morgan's Regional Stormwater Management Plan and Construction General Permit issued by Colorado Department of Public Health and Environment.
e) Reclamation operations will start immediately, after drilling and completion operations cease, and will be completed as soon as practical under prevailing weather conditions.
f) Reclamation of the pipeline ROW will be initiated immediately after completion of construction activities.
g) Final reclamation would include removal of all surface pipelines, permanent closure of subsurface pipelines, plugging and abandoning of the well, removal of all gravel, re-contouring of the well pad and any other surface reclamation required by the BLM or private land owner (see Design Criteria #46).

1.11 Surface Ownership

a) The proposed wellpad location, access road, and approximately 4,110 ft. of flowline would be located on private land. Landownership information is listed in Table 3.

1.12 Other Information

a) Kinder Morgan CO_2 Company will provide a copy of the SUPO to the dirt contractor prior to commencing any work. A copy will be made available on-site during construction.
b) The Kinder Morgan representative for operation, engineering, or regulatory issues are Andy Antipas (970) 882-5534 or Phil Kennedy (970) 882-5527.

2. DESIGN CRITERIA AND BMPS

The Design Features (DF) and BMPs included in Table 4 take precedence over any or all terms and conditions previously considered during this planning effort. Kinder Morgan and its contractors should refer to the DF and BMPs for specific information associated with construction, drilling, production, and reclamation.

Exceptions or waivers from these DF and BMPs are only granted with written permission from the BLM Authorized Officer.

Table 4. Project DF/Conditions of Approval (COA)

DC #	Topic	Condition
Design Features That Apply to All Aspects of the Project		
1, 2	Pre-Project Planning	**#1 BLM Point of Contact**—The operator or operator's contractor will contact the BLM Authorized Officer (Tracy Perfors at 970-882-6856) at least 7 days before beginning any surface-disturbing activities and at least 7 days before beginning any reclamation.
		#2 Pre-Project Training—Before beginning any work, it is the responsibility of the Kinder Morgan to ensure that all employees and subcontractors of Kinder Morgan are informed by Kinder Morgan before commencement of operations that any disturbance to, defacement of, or collection or removal of archaeological, historic or sacred material will not be permitted. Violations of the laws that protect these resources will be treated as law enforcement/administrative issues.
3, 4	Cultural Resources	**#3 Confidentiality**— Kinder Morgan will ensure that all employees and subcontractors of Kinder Morgan will not disclose or release information regarding the nature and location of archaeological, historic, or sacred sites, without written approval by the BLM, pursuant to 43 CFR 7.18. Cultural resource 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 considered a violation of Federal statute.
		#4 Discovery— Pursuant to 43 CFR 10.4, Kinder Morgan will notify the Canyons of the Ancients National Monument Archaeologist, Vince MacMillan (970-882-5614), by telephone, with written confirmation, immediately upon discovery of human remains, funerary items, sacred objects, or objects of cultural patrimony. Further, Kinder Morgan will stop activities in the vicinity of the discovery and protect it until notified to proceed by the BLM Authorized Officer. 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 will be notified immediately at 970-882-5614 and the following procedures will be carried out. 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 BLM or BLM-permitted archaeologist. The Monument archaeologist will make a determination of the nature and significance of the discovery, and will determine the appropriate method of treatment for it. The permitted archaeologist will prepare any and all necessary treatment plans, with approval by the BLM. Treatment

DC #	Topic	Condition
		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.
5	Access	**#5 Restricted Movements**—All work, staging, and parking of equipment will be confined to the well pads, roads, and pipeline ROW. 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. Vehicular access to the pads will be strictly limited to authorized vehicles only; these vehicles are restricted to use on the drill pad only and no off-pad or off-road parking will be allowed. Vehicles and equipment may be staged on the production area of nearby Kinder Morgan wells and facilities, and will be removed immediately after construction and drilling is completed.
6	Trash	**#6 Refuse Removal**—Throughout the lifetime of the project, trash, and debris will be collected from the location and the surrounding area and removed to an approved sanitary landfill. During construction and drilling, the operator will collect trash and debris from the project area on a regular schedule, at least once per week. This trash will be stored in an appropriate on-site trash bin, which will prevent loss due to wind, and will be periodically hauled to a permitted landfill or disposal site. After completion of drilling activities, all solid waste materials (such as trash) would be collected and disposed in an approved facility.
7	Noxious Weeds	**#7 Pressure Washing**—Heavy equipment will be pressure-washed at an off-site location prior to entering the project area (defined as the well pad, new access road and the entire length of the HF-4 pipeline). This is a preventive measure for reducing noxious weed infestation at the drilling site. If equipment is moved directly from site to site while on this project, then pressure washing between sites is not required. However, pressure washing is required before the equipment can be used in the project area if equipment is removed from a site, used elsewhere, and then brought back to the project area. This pertains to dirt moving equipment such as bulldozers, backhoes, etc. Drilling equipment, pickup trucks and passenger vehicles do not require pressure washing prior to entering these sites.
8	Fencing/Cattle Guards	**#8 Fencing Integrity**—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 fences, cattle guards, gates are 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.
9	CWA Compliance	**#9 Clean Water Act Compliance**—Kinder Morgan will define surface water features based on the U.S. Army Corps of Engineers' (USACE) definition of jurisdictional waters of the U.S. (WUS). All potential jurisdictional WUS will be surveyed to determine the appropriate DF during construction. All impacts to wetlands and/or other WUS will comply with the General Conditions of Sections 401 and 404 of the Clean Water Act (CWA). All activities that result in the discharge of dredged or fill

DC #	Topic	Condition
		material in a jurisdictional WUS will be permitted with the USACE.
10, 11, 12, 13, 14, 15, 16, 17, 18	Stormwater/ Erosion Controls	**#10 Stormwater Design**—Stormwater controls will be implemented, inspected, and maintained for the well pads, roads, and production lines until final stabilization (as defined by CDPHE) has been achieved. Site-specific Best Management Practices (BMPs) will be implemented to minimize erosion and sediment transport from disturbed areas. Documentation will be maintained in accordance with Kinder Morgan's MSWMP and permit (CORO34610) with the CDPHE for all oil and gas construction activities for McElmo Dome and Doe Canyon. Attachment H for location of proposed BMPs.
		#11 Site Specific Data Sheet—Kinder Morgan will prepare a Site Specific Data Sheet (SSDS) that will identify site-specific BMPs and reclamation plans in accordance with COGCC, CDPHE, and BLM stormwater requirements. The SSDS functions as a supplemental attachment to the MSWMP. The SSDS will include the proposed locations of stormwater BMPs, cross drains, temporary use areas (TUAs), and other avoidance areas (including cultural sites, jurisdictional WUS buffers and/or buffers from springs/seeps or wetlands to restrict refueling). The SSDS will be provided to the BLM Resource Protection Specialist for review and approval.
		#12 Stormwater Specialist—Kinder Morgan will utilize a stormwater specialist with proof of training in stormwater control (such as the CDOT Erosion Control Supervisor certification) to design the stormwater control systems, supervise the installation/construction of stormwater control Criterias, and ensure adequate stormwater management.
		#13 Inspections and Maintenance—Kinder Morgan will maintain a rain gauge at each of the four compressor stations where there are active Kinder Morgan stormwater sites (Goodman Point, Yellowjacket, Hovenweep, and Doe Canyon). Post-storm event inspections will occur within 24 hours (safety considerations permitting) after precipitation events greater than or equal to 0.25 inch. Any repairs or maintenance identified by the Stormwater Specialist or by the BLM Resource Protection Specialist will be completed within the 2-day window stipulated by the CDPHE permit. Inadequate stormwater controls, as evidenced by erosion, cutting, soil loss or sediment transport off-site will require additional stromwater control measures. BMP maintenance (typically removal with a shovel) is dispersed within the ROW outside any actively eroding areas. Soil disposal from larger maintenance activities (i.e., those that require an excavator), would require prior-approval from the BLM Resource Protection Specialist. Contaminated soil is disposed of in a solid waste disposal facility.
		#14 Jurisdictional WUS Crossings—Kinder Morgan will design all jurisdictional WUS crossings to withstand a 25-year storm event. An engineering design will be provided to the BLM Resource Protection Specialist for review and approval. Pipeline construction within the ordinary high water mark of jurisdictional WUS will be completed in less than 3 days and occur during dry weather conditions. Reclamation of the channel will include matching pre-existing contours to prevent any obstructions to flow. Travel across jurisdictional WUS will occur, as required, to construct the flowline. The minimum bury depth below jurisdictional WUS will be 4 feet below the channel bottom. Equipment will not be refueled within 100 feet of a jurisdictional WUS. The engineered crossing on private land may be used thereafter to access the pipeline ROW to construct and maintain the flowline.
		#15 Fill Restrictions—No fill will be placed in jurisdictional WUS without a CWA, Section

DC #	Topic	Condition
		404 Permit. Stormwater controls will be implemented in accordance with the MSWMP and SSDS to assure that sediment will not be transported into a jurisdictional WUS or tributary drainage.
		#16 Buffer Zones—All excavated material and/or vegetation, timber slash, and rocks will be stockpiled a minimum of 100 feet away from the centerline of all jurisdictional ephemeral channels, and a minimum of 200 feet from the center line of jurisdictional intermittent channels. Kinder Morgan will flag the buffer zone prior to construction. Maps of channels and buffer zones will be submitted to the BLM for approval.
		#17 Road and Pipeline Cross Drainage—Culverts for road and pipeline cross drainage (excluding jurisdictional WUS) will be 18-inch minimum diameter. All culverts used in construction will be corrugated metal pipe made of steel, properly bedded, and backfilled. Only undamaged culverts will be used. Culverts will be identified in the SSDS for BLM review and approval.
		#18 Erosion and Dust Controls—Access roads and well pads will be adequately surfaced, compacted, and wetted down to avoid dust and loss of soil through wind erosion. Inadequate stormwater controls identified by the BLM Resource Protection Specialist will be addressed within 2 days.
19	Visual	**#19 Painting**—All surface production equipment constructed or installed at the HF-4 wellhead or within the pipeline ROW shall be painted with the flat, non-reflective earth-tone color Shale Green from the BLM's Standard Environmental Color Chart CC-001 (June 2008) to minimize contrast with the existing environment.
20	Noise	**#20 Noise Levels**— All production equipment located within the Monument shall be managed to comply with COGCC noise standards (800 Series Rules), as required by the CANM Resource Management Plan (page 82). COGCC noise regulations during drilling, completion, workover, facilities installation or maintenance are subject to the maximum permissible noise levels for industrial zones (COGCC Rule 802.b.1).
21	Access Roads	**#21 Surface Rutting**—The access roads shall be maintained reasonably smooth and free of ruts in excess of 3 to 4 inches, soft spots, chuckholes, rocks, slides, and washboards. A regular maintenance program shall include blading, ditching, sign replacement, surfacing, culvert maintenance, and maintenance of stormwater features. All vehicles servicing the well are restricted to use of the approved access road and well pad. Construction and drilling activities will not be conducted when vehicles and/or construction equipment will cause erosion or sedimentation beyond the road corridor.
22	Hazardous Materials	**#22 Spills and Leaks**—Spills and leaks will be cleaned up immediately and contaminated soils will be removed to a permitted disposal site. BLM and COGCC spill reporting procedures will be followed. COGCC requires reporting of any spills of volume greater than 1 barrel, if spilled outside of containment. Before being placed into service, all flowlines will be pressure tested with fresh water at a maximum of 125% of the maximum design pressure for at least four hours, non-destructively tested by X-ray inspection of 100% of welded connections and externally coated with fusion bonded epoxy or a field-applied epoxy coating to protect against external corrosion. After flowlines and water lines are placed into service, Kinder Morgan will test them in accordance with COGCC Rule 1100 (see Table 6). During operation, pressures are monitored with a SCADA system with low pressure alarms. Rights-of-ways are patrolled once per month to check for leaks. Records are kept on file.

DC #	Topic	Condition
		Criteria That Apply to Construction and Drilling
23	Record Keeping	**#23 SUPO**—A copy of the DC and the operator's (SUPO) and BLM Conditions of Approval must be located at the well pad during construction, drilling, and completion activities.
24, 25	Cultural Resources	**#24 Fencing**— Temporary fences will be erected, either by or under the direction of a BLM or BLM-permitted archaeologist, adjacent to the cultural resource sites specified in the project cultural resource report prior to the start of construction activities. All temporary fencing and other site markers will be removed within 10 days of of the completion of adjacent construction activities.
		#25 Monitors- All soil removal operations and trenching for the well pads, pipelines, and building of access roads would be monitored by a BLM or BLM-permitted archaeologist for subsurface cultural resources. 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). Sites determined as "not eligible" for the National Register of Historic Places located 10 meters or less from construction will be monitored once during initial ground disturbance. Monitoring results will be submitted in writing upon completion of each phase (initial, periodic, and final). 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 operations.
26	Storm Water Controls	**#26 Eyebrow Ditches**—For the well pad location, an "eyebrow ditch" shall be installed above the locations on the uphill 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. Any natural moisture will be diverted off the pads and away from the location. The well pads would be designed in such a manner as not to allow run-on water to enter the pads.
27, 28	Liquid Containment Structures	**#27 Spill Prevention Measures**—All components of the closed-loop drilling system and all non-fresh water tanks (including hose and manifold connections) shall be located within impermeable, lined (with at least 30-millimeter liner) areas capable of containing 120 percent storage capacity of the largest container in the area. Absorbent pads, impermeable liners, or spill guard systems must be placed under all drilling equipment engines. The liner should be visually inspected prior to installation on location. Any equipment placed on the liner shall be placed on traction mats/pads protecting the liner surface. All equipment will be checked, cleaned, and tested before being sent to a new location. All hoses will be checked for dry rot, cracks, wire showing, punctures, or kinks before being put into use. All cam lock hose connections will be checked for swelling and cracks before putting into use. All threads will be inspected for function prior to making connections.
		#28 Tanks—All non-fresh water storage tanks (including roll-off cuttings storage

DC #	Topic	Condition
		tanks) must be pre-cleaned prior to arriving on location, and installation, and utilization. In addition, all hose connections, bowlines, and manifolds must be inspected and tested to be leak-free prior to delivery.
29	Degreasing	**#29 Degreasing**—Degreasing of machinery or equipment will occur on liner in order to protect soils from contamination.
30	Solid Drill Cuttings	**#30 Cuttings**—All solid drill-cutting waste shall be collected, stored in leak-proof roll-off containers, and transported to and disposed of at an off-site licensed commercial waste disposal facility. No waste material other than drill cuttings are allowed to be stored in the roll-off cuttings storage containers.
31, 32, 33	Biology	**#31 Raptors**—If construction is scheduled to occur during the raptor-breeding season, described between March 15 and August 31, nest surveys for raptors are required prior to any ground disturbance where nest habitat occurs within 0.25-mile of the proposed action area. If active nests were found, ground-disturbance within 0.25-mile of the nest would be postponed until after the nest successfully fledges young or fails, as determined by a biologist. With the approval of the authorized officer, a biological monitor (the BLM or BLM-approved contractor) may be present during construction to avoid nest destruction/disturbance. During years when a historic nest site is unoccupied by or after May 15, the seasonal limitation may be suspended. Nest activity may be verified by surveying the site using a BLM-approved raptor protocol. Surveys must be done during the year of construction by a qualified biologist, and accepted and documented by BLM staff.
		#32 Migratory Birds— Avoid surface disturbing activities during the migratory bird breeding season (between May 15 and July 30), if possible. Construction outside of the breeding season does not require nest surveys. If construction is scheduled to occur between May 15 and July 30 vegetation clearing can occur outside of the breeding season, from July 31 to May 14. If vegetation clearing will not avoid the breeding season, migratory bird nest searches are required prior to any ground disturbance where nesting habitat occurs in the proposed action area. If active nests were found, vegetation removal would be postponed until after the nest successfully fledges young or fails, as determined by a biologist. With the approval of the authorized officer, a biological monitor (the BLM or BLM-approved contractor) may be present during construction to avoid nest destruction/disturbance.
		#33 Eagles— In the event a bald eagle roost or bald or golden eagle nest is observed in the proposed action area, the authorized officer, Tracy Perfors (970-882-6856), should be contacted immediately. The BLM has identified the following restrictions (CANM RMP 2010) a) Bald and golden eagle NSO within .0.5-mile radius of roost or nest site. Exception: The NSO applies to the essential features of the winter roost site complex. The NSO area may be altered depending on the active status of the roost or the geographical relationship of topographic barriers and vegetation screening. There are no exceptions for nest sites. b) Timing restriction within 0.5 mile of a golden eagle nest from December 15 to July 15 or for a bald eagle nest from November 15 to July 15 for nesting habitat. Exception: During years when a nest site is unoccupied by or after May 15, the timing limitation may be suspended. It may also be suspended once the young have fledged and dispersed from the nest. c) No surface disturbing activities within 0.5-mile of a bald eagle winter roost

DC #	Topic	Condition
		from November 16 to April 15. Exception: If there is a partial or complete visual screening of the area of activity, the primary zone around the roost site may be reduced to 0.25-mile.
34	Lighting	**#34 Downcast Lighting**—Any permanent lighting will be downcast to reduce visual light pollution.
35	Topsoil Stock Piling	**#35 Stocking Piling**—The top six inches of topsoil will be stripped and stockpiled within the authorized area of disturbance for use in reclamation. To preserve topsoil health and viability, topsoil storage piles shall not be more than 3 feet high (deep) with a sign designating the material as top soil. If the topsoil stockpile is not spread over reclaimed areas within 6 months, it will be seeded to ensure topsoil integrity and prevent erosion.
36	Water	**#36 Water Withdrawals**—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. The Colorado Division of Water Resources (WRD) requests notification 2 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 WRD 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 WRD in Durango, Colorado at (970-247-1845); the contact for the Water Commissioner for the Dolores River is found at (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 WRD, the operator must apply and obtain water rights prior to water withdrawals. The operator will comply with all state and local water laws and regulations.
37	Paleontology	**#37 Resource Evaluations**—Screening for paleontology resources, per the approved McElmo Dome Unit work plan, will be completed as part of permitting activities. Any potential resource concerns will be addressed prior to initiation of construction activities.
		Criteria That Apply to Reclamation Activities
38	Topography	**#38 Land Contours**—During reclamation, those portions of the pipeline ROW deemed unnecessary for production shall be shaped to conform to the natural terrain. Any topsoil stockpiled during construction should be spread back over the re-contoured, construction areas and reseeded. The brush, limbs, and other woody material stockpiled during construction, shall be spread back over reclaimed areas after seeding. This reclamation shall begin immediately after completion of the pipeline construction, as long as soil conditions are appropriate for reclamation. Notify the Surface Managing Agency representative (Tracy Perfors at 970 882- 6856) 7 days prior to seeding so that he or she may be present to witness reseeding activities.
39	Reclamation	**#39 Woody Material—**All brush, limbs, and other woody material will be stockpiled separately from the topsoil within the authorized area of disturbance. Stockpiled vegetative material will not be covered by well pad fill slopes or otherwise buried under spoils from well pad construction. The stripped vegetation shall not be removed from the location (it will be used later for reclamation).
40	Well Pads	**#40 Unused Portions of Wells Pad**—During interim reclamation, those portions of the well pad deemed unnecessary for production shall be shaped to conform to the natural terrain, using 100 percent of the stockpiled topsoil. These areas should then be reseeded, leaving only a teardrop shaped area for access to the wellhead during

DC #	Topic	Condition
		operations and/or work-over activities. The brush, limbs, and other woody material stockpiled during construction, if any, should be spread back over reclaimed areas after seeding. Interim reclamation shall begin as soon as possible after completion of the well and final production activities.
41, 42, 43	Seeding	**#41 Seed Types**—The seed mixture (shown in Table 5) shall be used for reseeding during reclamation of the pipeline ROW. Another seed mixture may be specified in a landowner Surface Use Agreement for private land sections of the project area.
		#42 Seeding Rates—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.
		#43 Certified Seeds—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 this information with the seed labels from each bag to the authorized officer.
44	Fencing	**#44 Fencing Standards**—If necessary, 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 well location area and shall follow wildlife-friendly guidelines (the "3-wire all smooth, 3-wire top and bottom smooth, 4-wire all smooth, or 4-wire top and bottom smooth" standards) from Colorado Parks and Wildlife (refer to: http://wildlife.state.co.us/SiteCollectionDocuments/DOW/WildlifeSpecies/Coexisting/fencing.pdf). The private property/BLM boundary fence will be maintained in as good or better condition after pipeline construction activities are completed.
45	Noxious Weeds	**#45 Pesticides**—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 using 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 on BLM land, the Holder shall obtain approval from the authorized officer of a Pesticide Use Proposal that shows 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 on BLM land, Pesticide Application Records (BLM Form 3-3-94) must be submitted to the BLM 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 10 years.
46	Soils	**#46 Soil Treatments**—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 according to the seed mix detailed in Table 5. All access roads will be shaped to conform to the

DC #	Topic	Condition
		natural terrain and left as rough as possible to deter vehicle travel. The access road will be ripped along the contour when possible, to a minimum depth of 6 inches, water barred, and reseeded according to the seed mix listed in Table 5. All erosion problems created by the development must be corrected prior to acceptance of release. Water bars should be spaced (as shown in Table 6) along the fall line of the slope.
47	Reclamation	**#47 Reclamation Standards**—Reclamation (whether interim or final) will be considered successful when the desired vegetative species are established at 70 percent cover or higher, as compared to reference sites with undisturbed vegetation. In addition, erosion must be controlled, weeds must be considered a minimal threat, there must be evidence of vegetation reproduction (either spreading by rhizomatous species or seed production), and it is deemed likely that ground cover will return to a desirable condition. Until these standards are met, the operator will be required to continue revegetation efforts at the direction of BLM.
48	Reclamation	**#48 Signage**—If the BLM requests, Kinder Morgan will install signs saying "Reclamation Area – please keep off" on reclamation areas that may get vehicle or tourist traffic. Kinder Morgan will also put natural debris such as tree trunks or boulders on reclamation areas to limit vehicle traffic if the BLM requests.
General Wildlife Protection Measures		
49, 50, 51		**#49 Injured/Dead Sensitive Species**— The operator will notify the Bureau of Land Management (BLM) authorized officer and nearest Fish and Wildlife Service (FWS) Law Enforcement office within 24 hours, if the operator discovers a dead or injured federally protected species (i.e., migratory bird species, bald or golden eagle, or species listed by the FWS as threatened or endangered) in or adjacent to a pit, trench, tank, exhaust stack, or fence. (If the operator is unable to contact the FWS Law Enforcement office, the operator must contact the nearest FWS Ecological Services office.)
		#50 Vent Pipe/Exhaust Screening—Production equipment with vent pipes, exhaust stacks, or other areas that may provide access for migratory birds and bats must be screened to exclude wildlife. Mesh screening must be no larger than ¼ inch.
		#51 Work Over Operations—Work over operations that may disturb wildlife between December 1 and July 31 need to be coordinated with the BLM TRFO.

Table 5. Project Seed List

Common Name	Species Name	Variety	PLS/lbs/ac*
Sand Dropseed	Sporobolus cryptandrus	VNS	0.05
Galleta	Hilaria jamesii	Viva, florets	1.6
Big Sagebrush	Artemisia tridentate	VNS	0.1
Winterfat	Krascheninnikovia lanata	VNS	0.25
Four-wing Saltbrush	Atriplex canescens	VNS	0.25
Indian Ricegrass	Achnatherum hymenoides	Paloma	2.5
Blue Grama	Chondrosum gracile	Alma	0.3
Squirreltail	Elymus elymoides	Tusas	1.4
Muttongrass	Poa fendleriana	CO Source ID	0.1
Total			**6.6**

*This reflects the drilled seeding rate of 40 PLS/ft^2, it needs to be double if broadcast.

Key: Ft^2 = square feet: VNS=variety not stated, get most local variety available.

Table 6. Water Bar Spacing Interval

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

Table 7. COGCC Conditions of Approval

COA#	Topic	COA
1	Notifications	**#1** Notify the COGCC 48 hours prior to start of pad construction, rig mobilization, spud, and start of hydraulic stimulation operations using Form 42. The appropriate COGCC individuals will automatically be notified via email. All personnel must be hydrogen sulfide (H2S) trained and proper air monitoring for H2S must be implemented during drilling, completion, and production operations. Emergency response plan for H2S must be on-site at all times. As required for Groundwater Baseline Sampling, the operator shall comply with Rule 609 - STATEWIDE GROUNDWATER BASELINE SAMPLING AND MONITORING.
2	General BMPs	**#2** The operator must implement BMPs to contain any unintentional release of fluids, including any fluids conveyed via temporary surface pipelines or buried permanent pipelines. The operator must ensure secondary containment for any volume of fluids contained at the well site during drilling and completion operations (see Table 8) including, but not limited to, construction of a berm or diversion dike, diversion/collection trenches within and/or outside of berms/dikes, site grading, or other comparable measures (i.e., BMPs associated with stormwater management) sufficiently protective of nearby surface water.

COA#	Topic	COA
		Any berm constructed at the well pad location will be stabilized, inspected at regular intervals (at least every 14 days), and maintained in good condition. The access road will be constructed and maintained so sediment will not be allowed to migrate from the access road to nearby surface water or any drainages leading to surface water. Strategically apply fugitive dust control measures; including enforcing established speed limits on private roads to reduce fugitive dust and coating vegetation and deposition in water sources. Berms or other containment devices shall be constructed to be impervious to contain any spilled or released material around crude oil, condensate, and produced water storage tanks.
3	Testing/Drilling	#3 A closed-loop system (which the operator has indicated on Form 2A) must be implemented during drilling. All cuttings generated during drilling with high chloride mud must be kept in containers or on a lined/bermed portion of the well pad prior to analysis and/or offsite disposal. The moisture content of any drill cuttings in a cuttings area or pile shall be as low as practicable to prevent accumulation of liquids greater than de minimus amounts. Flowback and stimulation fluids must be sent to tanks, separators, or other containment/filtering equipment before the fluids can be placed into any pipeline, storage vessel, or lined pit (only if an amended Form 2A has been submitted/approved and a Form 15 Earthen Pit Permitted has been submitted/approved) located on the well pad or into tanker trucks for offsite disposal. The flowback and stimulation fluid tanks, separators, or other containment/filtering equipment must be placed on the well pad in an area with additional downgradient perimeter berming. The area where flowback fluids will be stored/reused must be constructed to be impervious to contain any spilled or released material. The operator shall pressure test pipelines in accordance with Rule 1101.e. (1) prior to putting into initial service any temporary surface or permanent buried pipelines and following any reconfiguration of the pipeline network. The operator shall notify the COGCC Oil and Gas Location Assessment Specialist for Western Colorado (Dave Kubeczko; email dave.kubeczko@state.co.us) and the COGCC Field Inspector for Southwest Colorado (Shaun Kellerby; email shaun.kellerby@state.co.us) 48 hours prior to testing surface poly/steel or buried poly/steel pipelines. The operator must implement BMPs to contain any unintentional release of fluids along all portions of any surface pipeline route, if constructed, where temporary pumps and other necessary equipment are located.

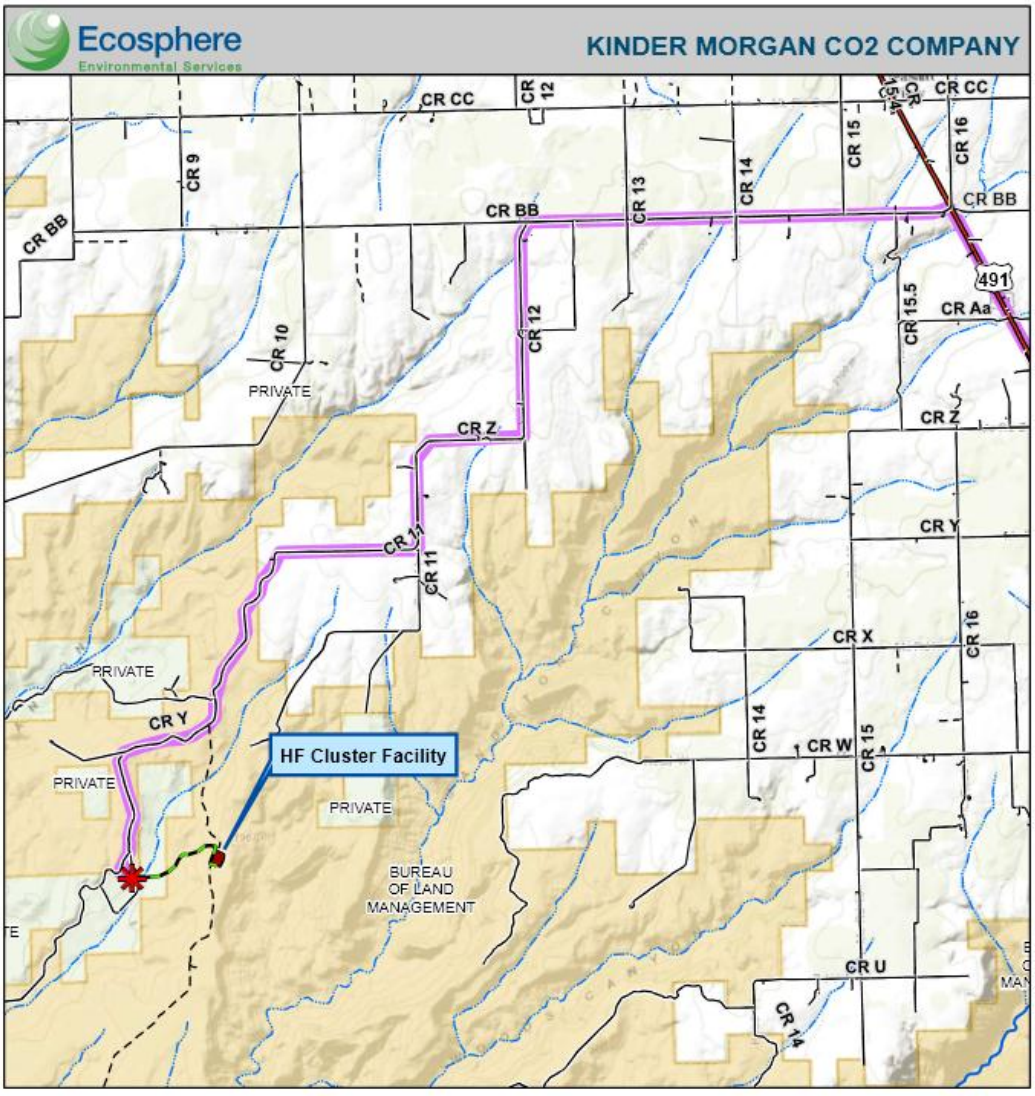
COA#	Topic	COA
		The operator must routinely inspect the entire length of any surface pipeline, if constructed, to ensure integrity. The operator shall conduct daily inspections of surface poly pipeline routes for leaks during active transfer of fluids. Inspections shall be conducted by viewing the length of the pipeline; operator will endeavor to minimize surface disturbance during pipeline monitoring. The operator shall maintain records of inspections, findings, and repairs for the life of the pipelines, if necessary. The operator will utilize, to the extent practical, all existing access and other public roads, and/or existing pipeline ROWs when placing/routing any surface or buried pipelines. This will reduce surface disturbance and fragmentation of wildlife habitat in the area.

Table 8. COGCC Best Management Practices

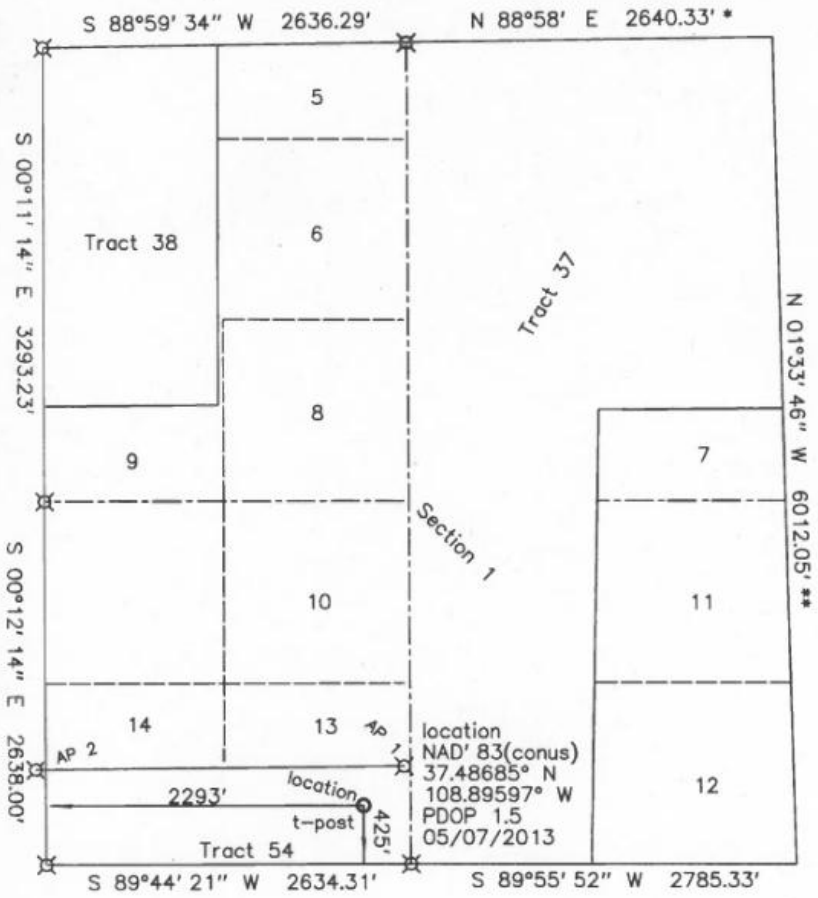
BMP#	Topic	BMP
1	Planning	**#1** A Kinder Morgan Fire Mitigation Plan is currently on file with the Montezuma County Planning Office. Any material not in use that might constitute a fire hazard will be moved a minimum of 25 feet from the wellhead, tanks and separator. Any electrical equipment installations inside the bermed area will comply with API RP 500 classifications and comply with the current national electrical code as adopted by the State of Colorado.
2	Traffic	**#2** A Road Use Plan, which addresses traffic concerns specific to the HF-4, is currently on file with Montezuma County. The traffic plan was produced after consulting with the county Road and Bridge Supervisor. All access roads are fully compliant with local county road standards. Access roads are composed of compacted gravel.
3	General House-keeping	**#3** Erosion control barriers, namely fiber wattles, will be placed at the edge of disturbance where necessary. Care will be taken to avoid disturbance outside of the project area unless it is deemed necessary for equipment stability and fire safety. On-site trash dumpsters are emptied regularly by the local waste management company. The well site will be adequately fenced to restrict access by unauthorized persons.
4	Storm water/Erosion Control	**#4** Fiber wattle will encompass the eastern and southern periphery of the disturbed area. A diversion ditch will be placed along the northern and western edges of the disturbed area. Wattles spaced approximately 70 feet apart will line the ditch. An earth berm will line the edges of the wellpad. Tackifier will be added to the stored topsoil piles to prevent erosion. Stockpiled soils will have slopes less than 3:1. Stormwater BMPs will be maintained/amended by Kinder Morgan as site conditions change throughout the construction and reclamation process.
5	Material Handling/Spill Prevention	**#5** The use of a closed-loop drilling system will reduce the amount of waste produced and water used during drilling operations. Solid cuttings will be disposed of at a licensed disposal facility. Recycled water will be disposed of in a Class I disposal well. Berms will be constructed around any condensate

BMP#	Topic	BMP
		and produced water tanks and will enclose an area sufficient to contain and provide secondary containment for 150% of the largest single tank. The berms will be sufficiently impervious to contain any spilled or released material. All berms and containment devices will be inspected at regular intervals and maintained in good condition. All load lines are capped. Tanks are designed to meet all API 650 guidelines.
6	Construction	**#6** All equipment will be stored within the ROW area of disturbance. Top soil will be removed to create a level pad for drilling and access road (length: 96 feet, ROW: 50 feet). Vegetation that does not need to be removed will be avoided during construction; removed vegetation will be cut near ground level, leaving the root system intact except where permanent facilities, roads, or ROWs require the complete removal of vegetation.
7	Noise Mitigation	**#7** During normal operations, the well will remain within COGCC regulations for noise. However, during the construction phase of the project, this standard may be exceeded occasionally. Drilling should be completed within 30 days. The use of Jake brakes by semi-trucks will be prohibited on county roads.
8	Emissions Mitigation	**#8** Non-flammable CO_2 will be produced from the Leadville formation and thus the green completion per rule 805 (3) does not apply. All CO_2 wells are equipped with a CO_2 leak detection monitor.
9	Drilling/Completion Operations	**#9** Blowout preventer equipment (BOPE) complies with COGCC equipment regulations. Mineral Management certification or Director-approved training for blowout prevention has been conducted for at least one person at the well site during drilling operations. Kinder Morgan conducts a BOPE test and files a 24-hour notice (Form 42) at the initial rig-up time, after each casing emplacement, and/or every 30 days. When a well is transferred from the Drilling Department to the Operations Department, Kinder Morgan standard operating protocol includes a checklist for well-site clearance activities. Adequate blowout prevention equipment is used on all well servicing operations. Back-up stabbing valves are used on well servicing operations during reverse circulation. These valves are pressure tested before each well servicing operation using low-pressure air and high-pressure fluid. No pits are present at the well site.
10	Interim Reclamation	**#10** Surface roughening, surface contouring, seeding, and weed control will be employed to facilitate vegetation reestablishment. Tackifier will be added to reclaimed areas.
11	Final Reclamation	**#11** All disturbed areas that are not necessary for operational procedures will be restored to at least 70 % of pre-disturbance vegetative cover.
12	Record Keeping	**#12** A copy of the COA and the operator's Surface Use Plan of Operations must be located at the well pad during construction, drilling, and completion activities.

Attachment B - Location Map



WELL LOCATION PLAT
Attachment C



0' 1000'

Scale: 1" = 1000'

Basis of bearing is assumed from GPS True North as shown.

standard GLO/BLM monument

set standard monument

* from GLO/BLM
** calculated

KINDER MORGAN CO2 COMPANY, LP
HF – 4
425' FSL & 2293' FWL
Section 1, T.37 N., R.19 W., NMPM
6247.8' grd. el. NAVD '88 (from OPUS)
Montezuma County, CO

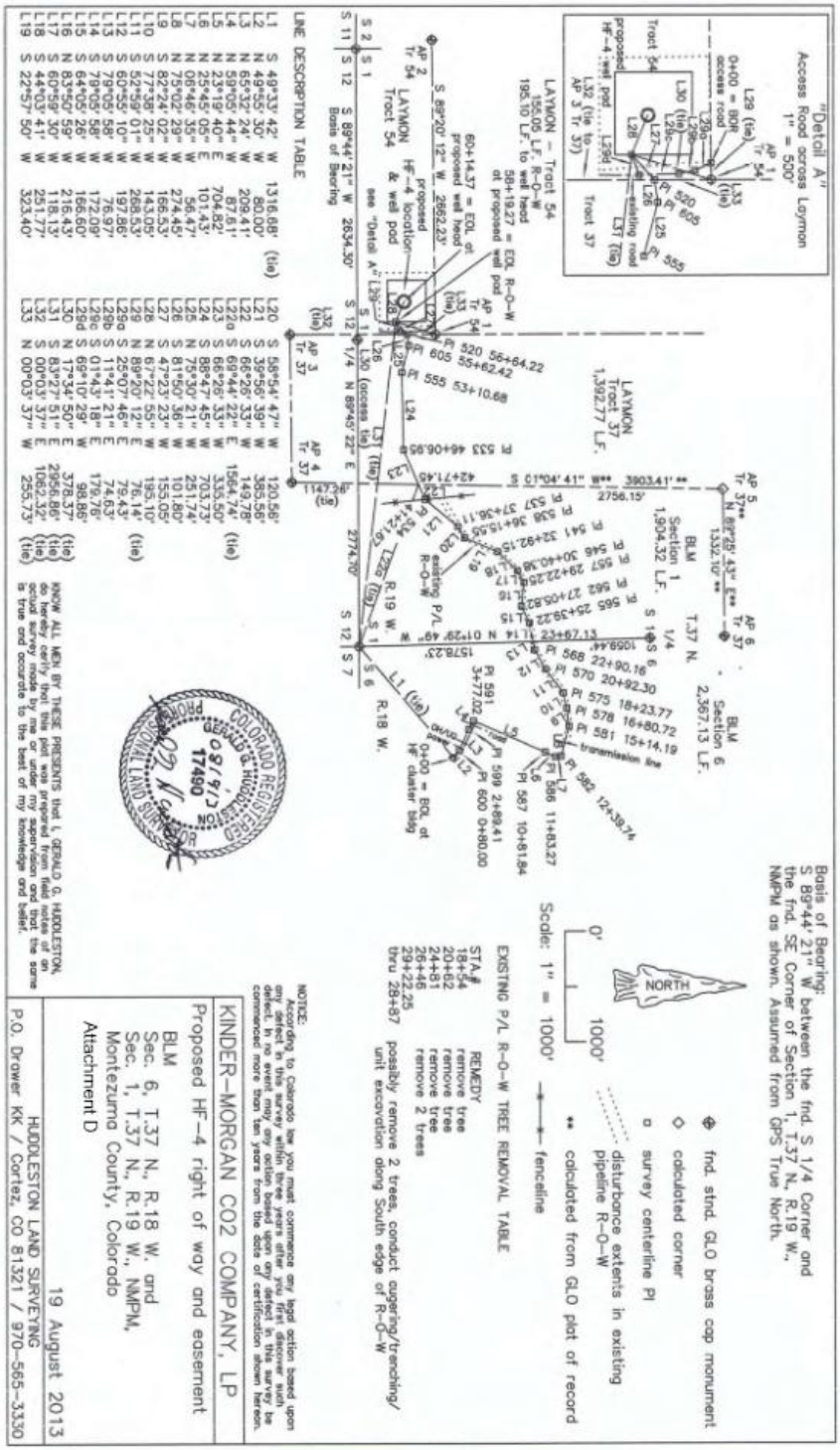
date of survey : 10/18/2011
& 05/07/2013
date of plat : 05/16/2013

Notes:
1)Distances/dimensions are perpendicular to section/aliquot lines.
2)Surface use is Fee grazing/hunting.
3)GPS was corrected with OPUS, GPS operator was R.J. Caffey, CO LS 36562
4)There are no improvements within 500 feet, except a fence on property line at 282 feet and driveway at 272 feet.

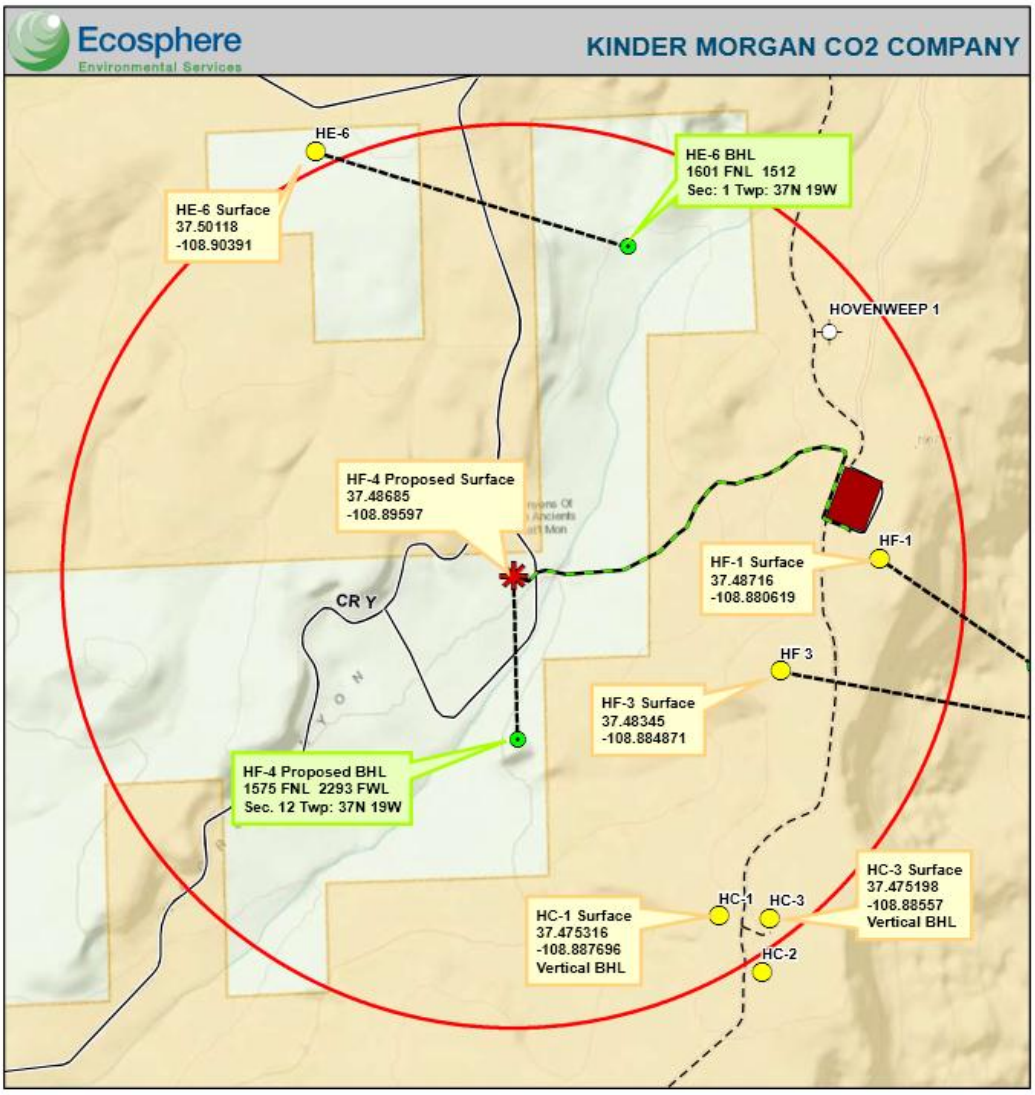
KNOW ALL MEN BY THESE PRESENTS that I, GERALD G. HUDDLESTON, do hereby certify that this plat was prepared from field notes of an actual survey made by me or under my supervision and that the same is true and accurate to the best of my knowledge and belief.

HUDDLESTON LAND SURVEYING – POD KK, CORTEZ, CO – 970 565 3330

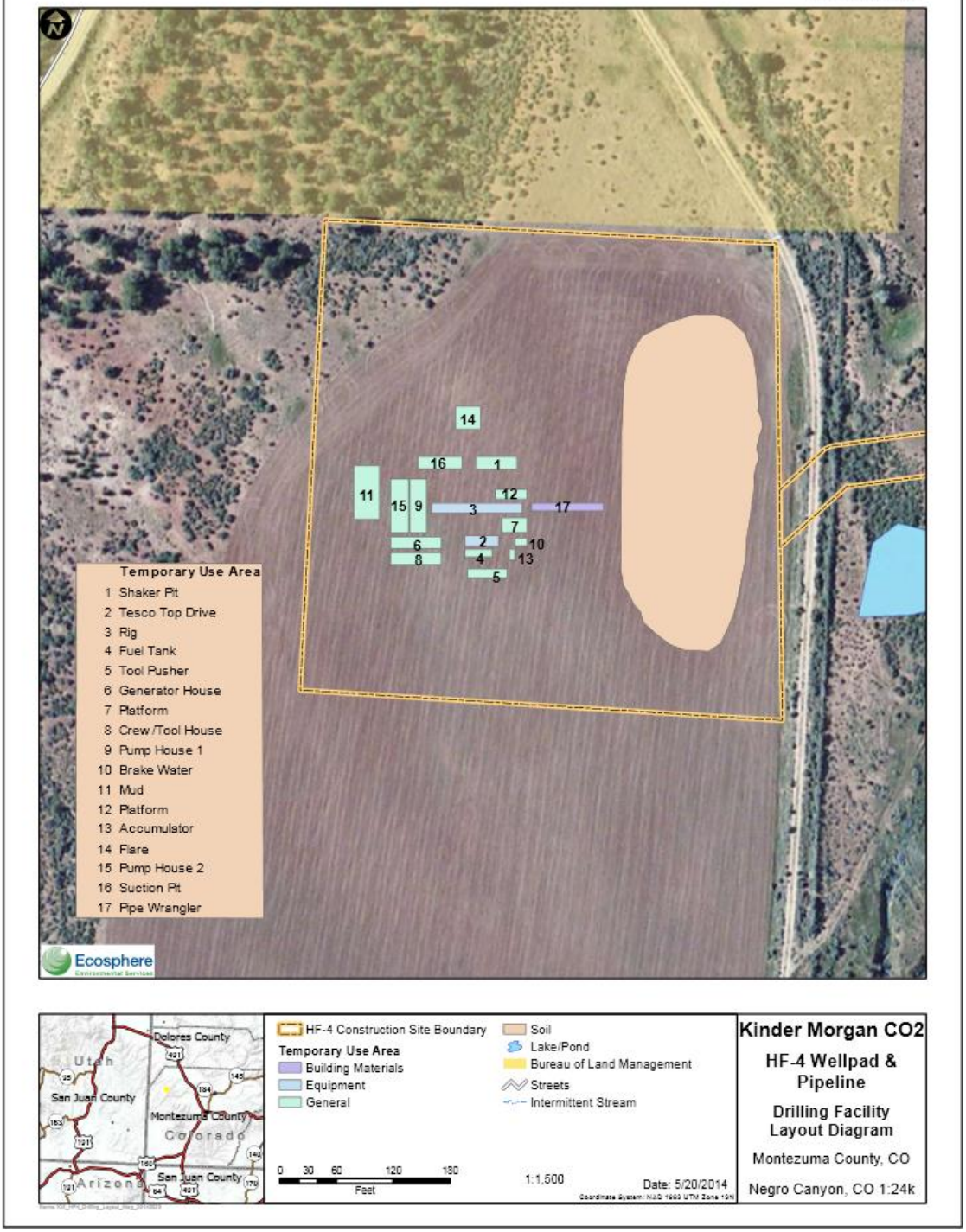
Attachment D

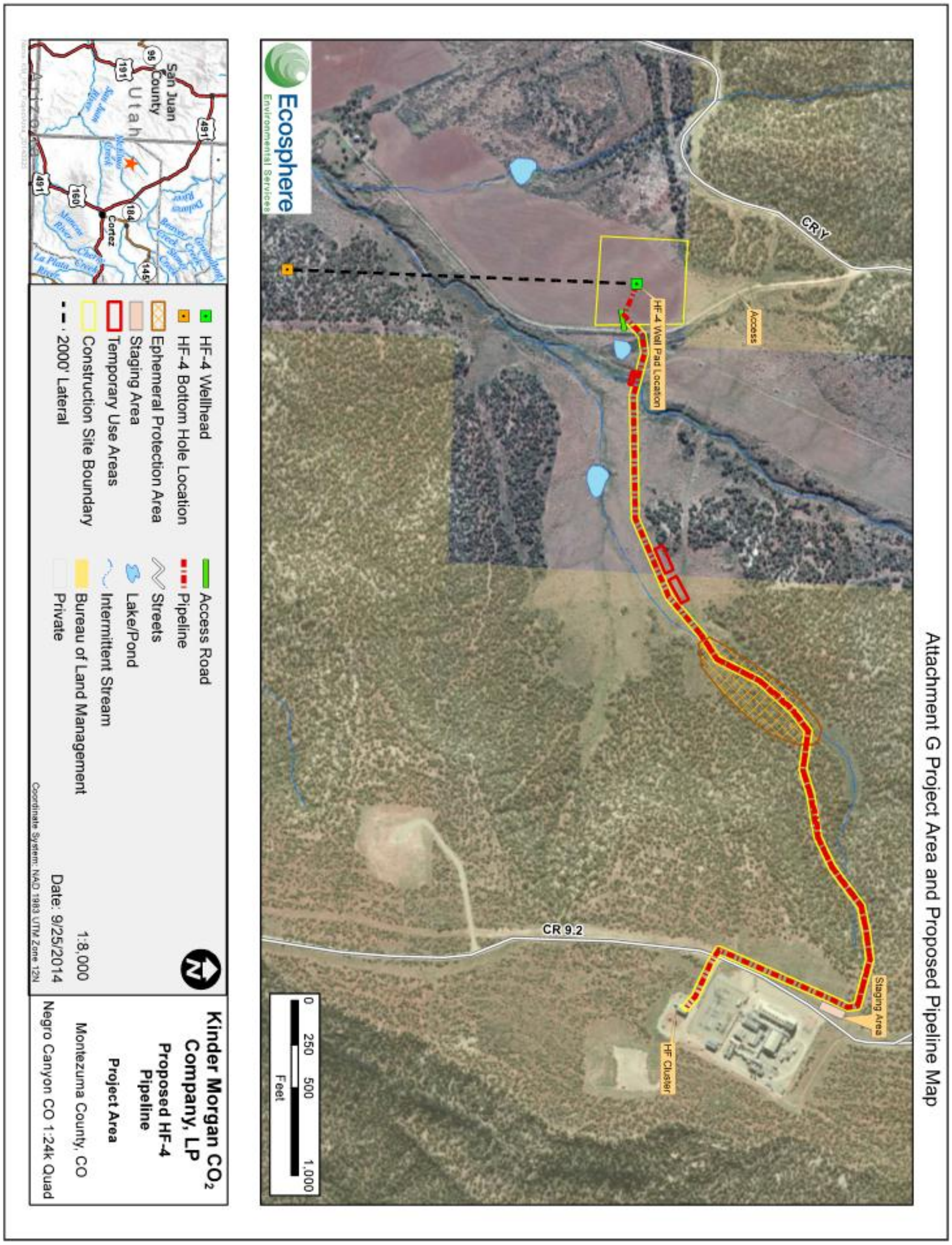


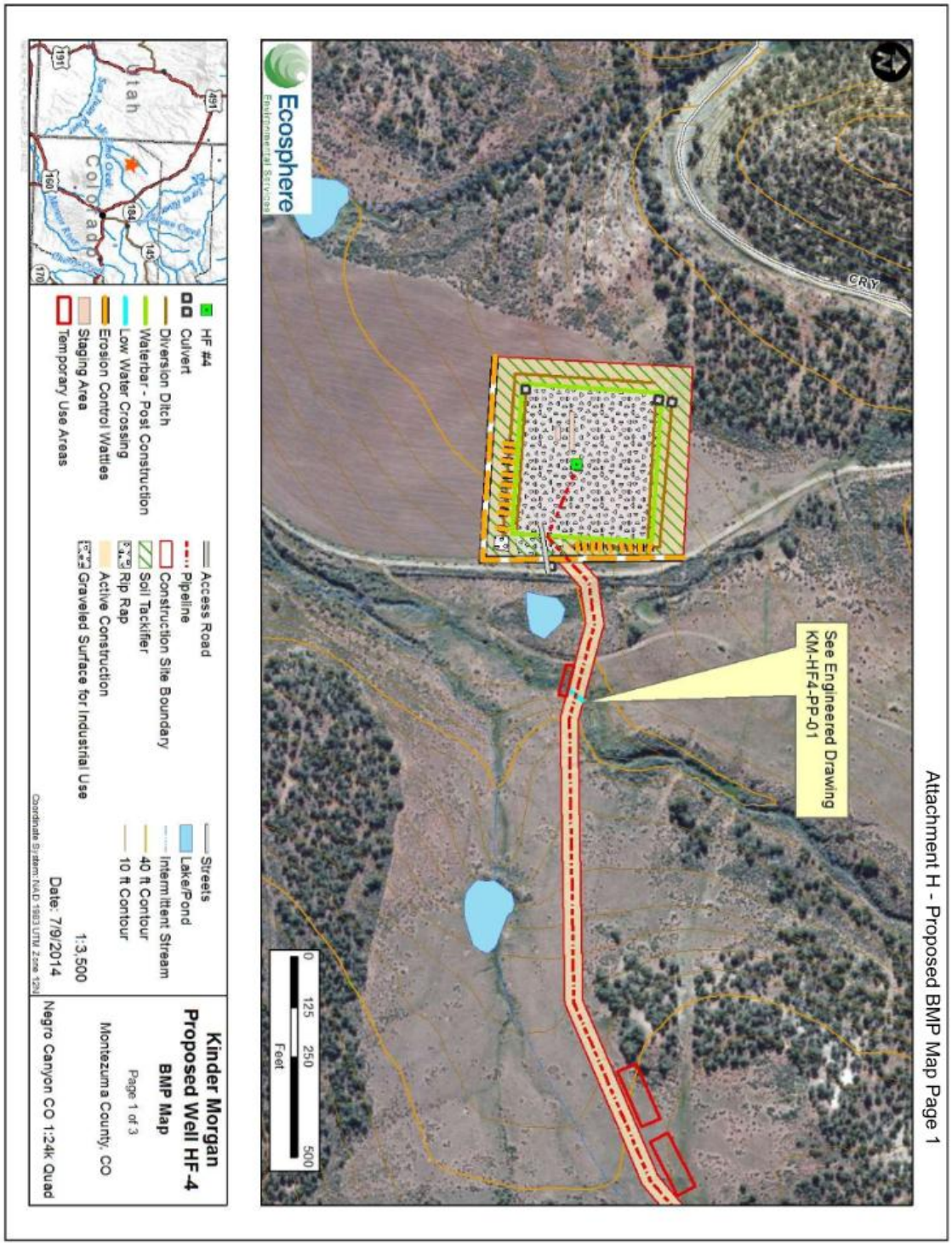
Attachment E

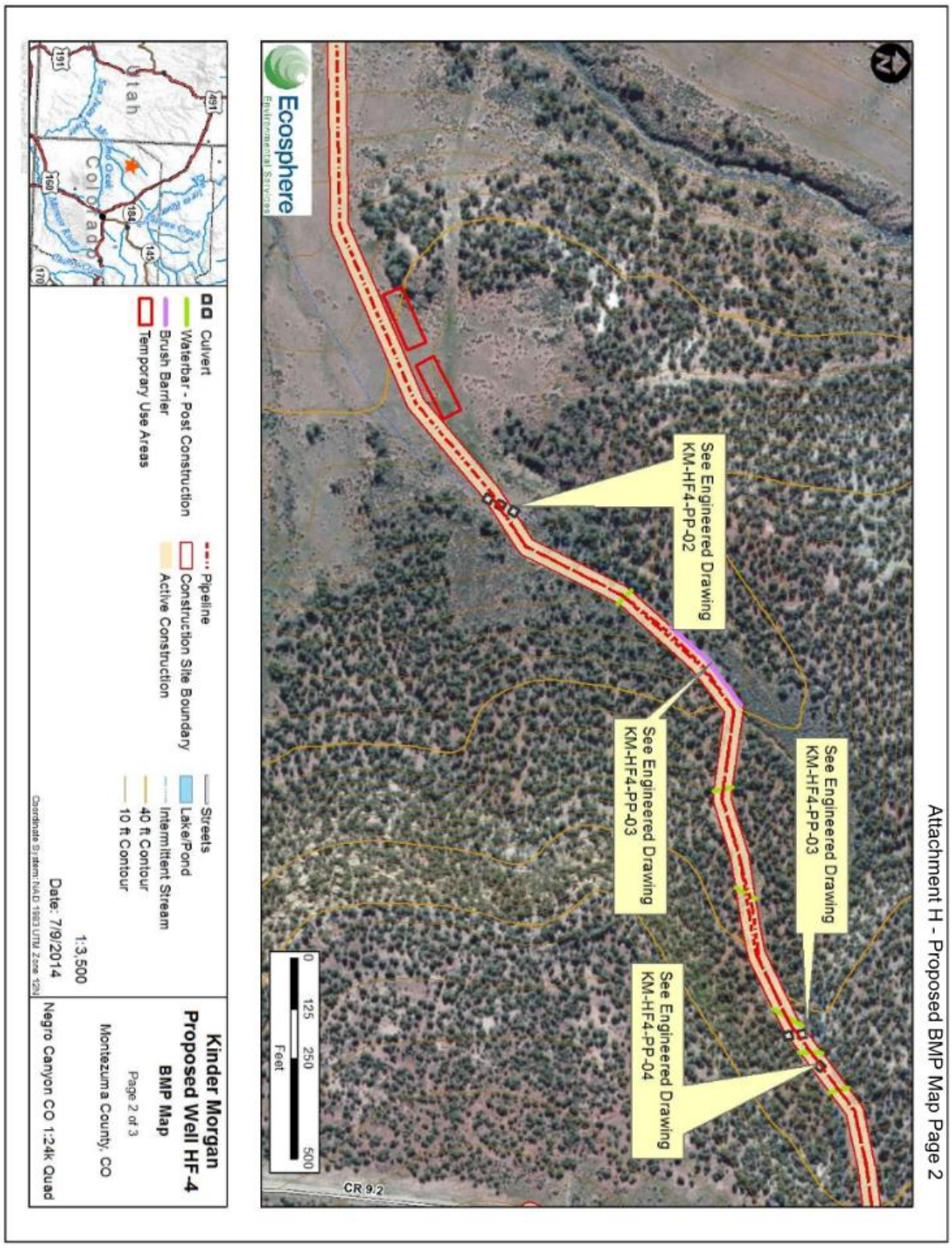


Attachment F




Attachment G Project Area and Proposed Pipeline Map
CR Y
Access
HF-4 Well Pad Location
CR 9.2
Staging Area
HF Cluster
0 250 500 1,000
Feet
Ecosphere
Environmental Services
HF-4 Wellhead
HF-4 Bottom Hole Location
Ephemeral Protection Area
Staging Area
Temporary Use Areas
Construction Site Boundary
2000' Lateral
Access Road
Pipeline
Streets
Lake/Pond
Intermittent Stream
Bureau of Land Management
Private
1:8,000
Date: 9/25/2014
Coordinate System: NAD 1983 UTM Zone 12N
Kinder Morgan CO2 Company, LP
Proposed HF-4 Pipeline
Project Area
Montezuma County, CO
Negro Canyon CO 1:24k Quad
San Juan County
Utah
Cortez


Attachment H - Proposed BMP Map Page 1
Ecosphere
Environmental Services
See Engineered Drawing
KM-HF4-PP-01
CRY
0
125
250
500
Feet
Kinder Morgan
Proposed Well HF-4
BMP Map
Page 1 of 3
Montezuma County, CO
Negro Canyon CO 1:24k Quad
Date: 7/9/2014
1:3,500
Coordinate System: NAD 1983 UTM Zone 12N
HF #4
Culvert
Diversion Ditch
Waterbar - Post Construction
Low Water Crossing
Erosion Control Wattles
Staging Area
Temporary Use Areas
Access Road
Pipeline
Construction Site Boundary
Soil Tackifier
Rip Rap
Active Construction
Graveled Surface for Industrial Use
Streets
Lake/Pond
Intermittent Stream
40 ft Contour
10 ft Contour
Utah
Colorado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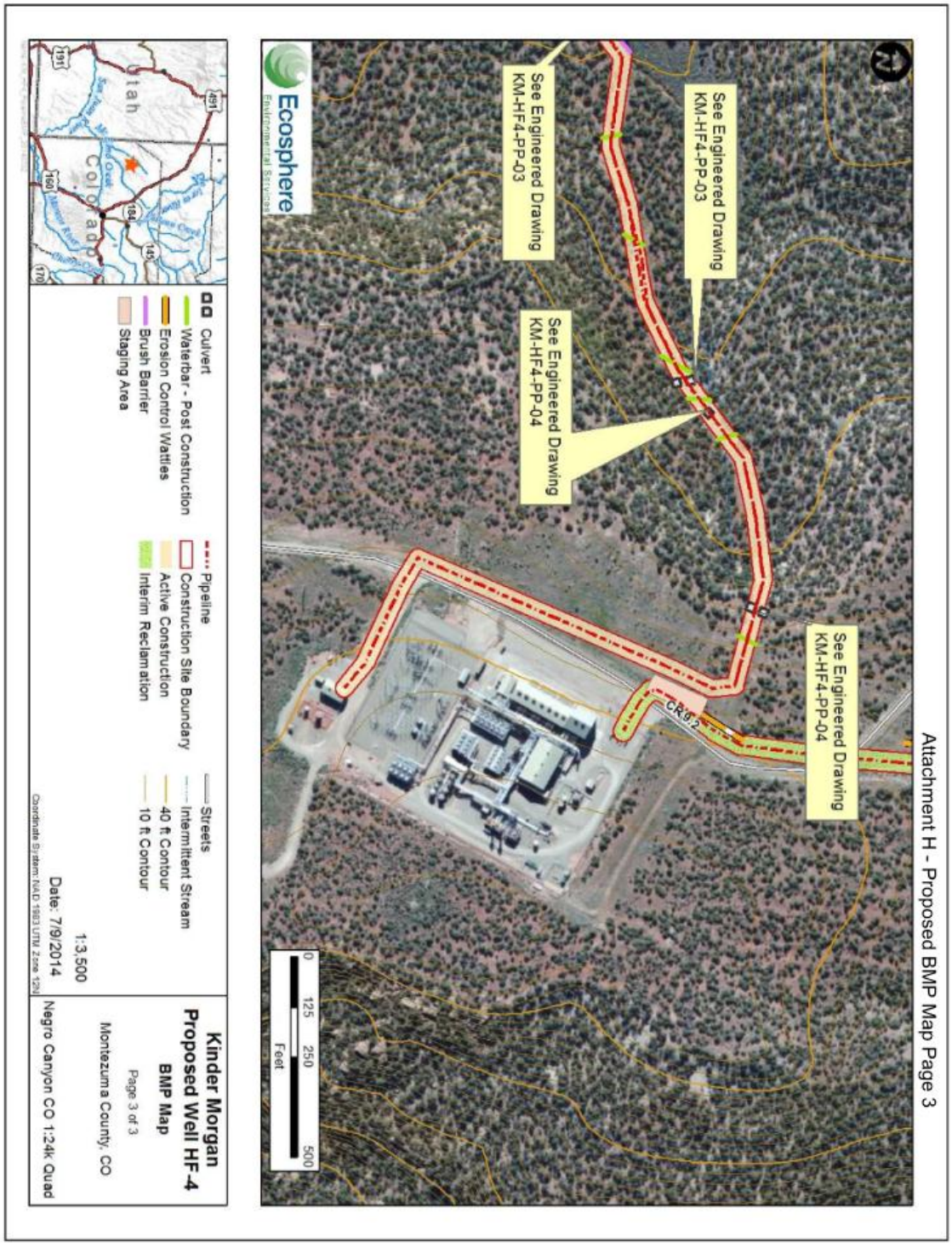
Ecosphere
Environmental Services
See Engineered Drawing KM-HF4-PP-02
See Engineered Drawing KM-HF4-PP-03
See Engineered Drawing KM-HF4-PP-03
See Engineered Drawing KM-HF4-PP-04
CR 9.2
0
125
250
500
Feet
Culvert
Waterbar - Post Construction
Brush Barrier
Temporary Use Areas
Pipeline
Construction Site Boundary
Active Construction
Streets
Lake/Pond
Intermittent Stream
40 ft Contour
10 ft Contour
1:3,500
Date: 7/9/2014
Coordinate System: NAD 1983 UTM Zone 12N
Utah
Colorado
Kinder Morgan
Proposed Well HF-4
BMP Map
Page 2 of 3
Montezuma County, CO
Negro Canyon CO 1:24k Quad


Attachment H - Proposed BMP Map Page 3
See Engineered Drawing KM-HF4-PP-03
See Engineered Drawing KM-HF4-PP-04
See Engineered Drawing KM-HF4-PP-03
See Engineered Drawing KM-HF4-PP-04
CR 9.5
Ecosphere
Environmental Services
0 125 250 500
Feet
Culvert
Waterbar - Post Construction
Erosion Control Wattles
Brush Barrier
Staging Area
Pipeline
Construction Site Boundary
Active Construction
Interim Reclamation
Streets
Intermittent Stream
40 ft Contour
10 ft Contour
1:3,500
Date: 7/9/2014
Coordinate System: NAD 1983 UTM Zone 12N
Kinder Morgan
Proposed Well HF-4
BMP Map
Page 3 of 3
Montezuma County, CO
Negro Canyon CO 1:24k Quad
Utah
Colorado
491
191
160
184
145
170