ENVIRONMENTAL ASSESSMENT

EA # NM-FOl0-2011-20

BURLINGTON RESOURCES OIL AND GAS COMPANY, LP

SAN JUAN 29-7 UNIT #86N
PROPOSED NATURAL GAS WELL AND PIPELINE PROJECT
LEASE USA SF-078423

Prepared for:

BUREAU OF LAND MANAGEMENT
FARMINGTON FIELD OFFICE

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ECOSPHERE ENVIRONMENTAL SERVICES

October 2010

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1.0 INTRODUCTION

Burlington Resources Oil and Gas Company LP (Burlington) has proposed directionally drilling a natural gas well in Rio Arriba County, New Mexico. The legal coordinates for the proposed San Juan 29-7 Unit #86N project are follows:

Well Pad Surface Location:
480' FNL (from the north line) and 2,075' FEL (from the east line)
Section 17, Township 29 North, Range 07 West
New Mexico Principal Meridian (NMPM)

Bottom Hole Location:
615' FNL and 2,055' FWL
Section 17, Township 29 North, Range 07 West, NMPM

Well-Tie Pipeline Location:
NE ¼ of Section 17, Township 29 North, Range 07 West, NMPM.

Surface disturbance activities associated with drilling the natural gas well would include construction of a twinned well pad and installation of a new subsurface well-tie pipeline. The proposed project would be located 0.25 mile north of Escondido Canyon on top of Manzanares Mesa and 1.5 miles south of Navajo City, New Mexico. Burlington has filed an Application for Permit to Drill (APD) for the natural gas well with the Bureau of Land Management Farmington Field Office (BLM/FFO). Enterprise Field Services, LLC would file for a right-of-way (ROW) grant with the BLM/FFO to construct and operate the proposed natural gas well-tie pipeline, if the well is productive. The proposed natural gas well project would be located on BLM lands with the federal mineral estate administered by the BLM/FFO.

1.1 Purpose and Need

The purpose of the proposed action is to allow the applicant to produce natural gas from the valid federal mineral lease USA SF-0079363 issued by the BLM in August 1948. Burlington subsequently acquired the lease operating rights in June 2006. The BLM's policy is to make mineral resources available for disposal and to encourage development of mineral resources to meet national, regional, and local needs. The Mineral Leasing Act of 1920, as amended (30 USC [United States Code] 181 et seq.), authorizes the BLM to issue oil and gas leases for the exploration of mineral resources and permits the development of those leases. The existing lease is a binding legal contract that allows development of the mineral estate by Burlington. An approved APD, issued by the BLM, would authorize Burlington to construct and drill the proposed natural well.

1.2 Conformance with Applicable Land Use Plan and Other Environmental Assessments

Pursuant to 40 Code of Federal Regulations (CFR) 1508.28 and 1502.21, this Environmental Assessment (EA) tiers into and incorporates by reference the information and analysis contained in the Farmington Proposed Resource Management Plan/Final Environmental Impact Statement (PRMP/FEIS) (BLM 2003a), which was approved as the Final Resource Management Plan for the BLM/FFO by the Record of Decision signed September 29, 2003 (BLM 2003b). The PRMP/FEIS and ROD are available for review at the FFO, Farmington, New Mexico or electronically at http://www.nm.blm.gov/ffo/ffo_home.html. This project EA addresses site specific resources and/or impacts that are not covered within the PRMP/FEIS, as required by the National Environmental Policy Act of 1969 (NEPA), as amended (Pub. L. 91-90, 42 USC 4321 et seq.). The proposed project would not be in conflict with any local, county, or state plans.

1.3 Federal, State or Local Permits, Licenses or Other Consultation Requirements

Under Section 402 of the Clean Water Act (CWA) (as amended), the U.S. Environmental Protection Agency (USEPA) regulates storm water discharges from industrial and construction activities under the National Pollutant Discharge Elimination System program. Additionally, Sections 404 of the Act, regulated by the U.S. Army Corps of Engineers, and Section 401 of the Act, regulated by the New Mexico Environment Department (NMED) or USEPA (depending upon surface ownership), protect wetlands and waters of the U.S. Operators are required to obtain all necessary permits and approvals for projects requiring CWA permits prior to any disturbance activities.

The New Mexico Energy, Minerals and Natural Resources Department requires oil and gas operators to follow "pit rule" guidelines contained with NMAC 19.15.17 to reduce the potential for ground water contamination from industry related activities.

Under section 7 of the Endangered Species Act (ESA) of 1973 (as amended), the BLM is required to consult with the U.S. Fish and Wildlife Service (USFWS) on any proposed action that may affect federally listed threatened or endangered species or species proposed for listing.

Compliance with Section 106, responsibilities of the National Historic Preservation Act, are adhered to by following the BLM – New Mexico State Historic Preservation Office protocol agreement, which is authorized by the National Programmatic Agreement between the BLM, the Advisory Council on Historic Preservation, and the National Conference of Council of State Historic Preservation Officers.

Additionally, Burlington will:

- Comply with all applicable federal, state, and local laws and regulations.
- Obtain the necessary permits for the drilling, completion and production of the well, including water rights appropriations, the installation of water management facilities, water discharge permits, and relevant air quality permits.
- Certify that a Surface Use Agreement has been reached with the private landowner, where required.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 Alternative A- No Action

The BLM NEPA Handbook (H-1790-1) states that for EAson externally initiated proposed actions, the no action alternative generally means that the proposed activity would not take place. This option is provided in 43 CFR 3162.3-2 (h) (2). This alternative would deny the approval of the APD and the current land and resource uses would continue to occur in the proposed project area. No mitigation measures would be required.

2.2 Alternative B - Proposed Action

Proposed Action Title/Type: San Juan 29-7 Unit #86N natural gas well project/Application for Permit to Drill and Right-of-Way Grant
County: Rio Arriba, ew Mexico
Applicant: Burlington Resources Oil and Gas Company, LP and Enterprise Field Services LLC
Surface Owners: BLM
Mineral Estate: BLM

Burlington has filed an APD for the proposed directional drilling of a natural gas well to access the federal mineral estate administered by the BLM/FFO. The proposed San Juan 29-7 Unit #86N natural gas well pad would be constructed on federal lands at 480' FNL and 2,075' FEL in Section 17 of Township 29 North, Range 07 West, NMPM in Rio Arriba County, New Mexico. The proposed natural well would be directionally drilled to access the Blanco Mesaverde/Basin Dakota Formation pool. A project vicinity map is provided as Figure l. The proposed action is shown on the Delgadito Mesa, New Mexico, U.S. Geological Survey (USGS) 7.5-minute quadrangle map as Figure 2. The proposed action is shown on the 2009 digital photo orthoquad as Figure 3.

Enterprise Field Services would construct and operate the proposed well-tie pipeline, if the well is productive. The proposed well-tie pipeline ROW would be constructed on federal lands Section 17, Township 29 North, Range 07 West, NMPM (Figure 2).

For a detailed description of design features and construction practices associated with the proposed action, refer to the project plats provided in the APD in Appendix A. Implementation of committed mitigation measures contained in the Conditions of Approval (COAs) and pipeline stipulations are incorporated and analyzed in this alternative. The COAs are provided in Appendix B.

Drilling of the proposed San Juan 29-7 Unit #86N natural gas well project would require construction of a 230-foot by 300-foot well pad with a 50-foot wide construction zone around the perimeter of the pad for a total of3.03 acres. Approximately 75%, or 2.27 acres, of the proposed well pad would overlap the existing San Juan 29-7 Unit #44C and San Juan 29-7 Unit #44E well pads. The construction of the proposed pad would require a maximum of 7 feet of cut in corner 2 with 8 feet of fill between corner 5 and corner 6 to provide a level pad for drilling (Appendix

A). An extstmg access road would be utilized. Pipeline installation would require approximately 50-feet in length of 4.50-inch outside diameter (OO) steel pipeline constructed within a 40-foot ROW. The proposed pipeline would connect the proposed San Juan 29-7 Unit #86N to the existing San Juan 29-7 Unit #44C pipeline. The entire length of the proposed well-tie pipeline would be located within the proposed well pad disturbance. The proposed project would result in approximately 0.76 acres of new disturbance. Total disturbance would be 3.03 acres.

Burlington would comply with all applicable federal, state and local laws and regulations and obtain the necessary permits for the installation of the well pad and the pipeline. All areas of proposed surface disturbance were inspected in the field to ensure that potential impacts to natural resources would be minimized through the implementation of mitigation measures. These measures are described for all resources potentially impacted in Section 4.0 of this EA.

Construction activities associated with the proposed action would include drilling the proposed natural gas well and the installation of any surface equipment necessary for natural gas production. Construction of the proposed well would commence following BLM/FFO approval of Burlington 's APD. In general, construction of the well pad project would follow the sequence listed below.

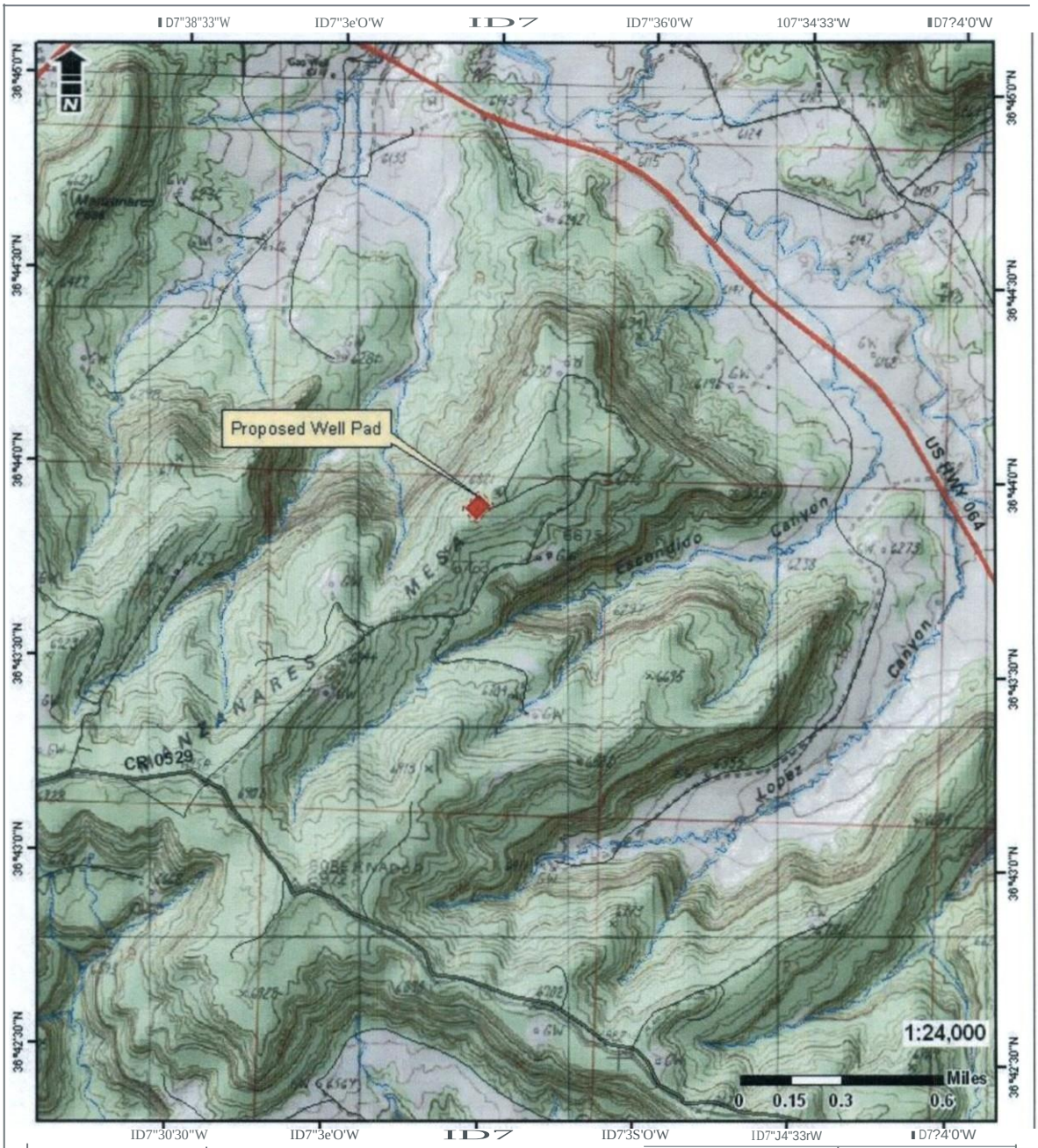
1. Construction crews remove vegetation from the proposed natural gas well project site. Excavated materials from the cuts would be used on the fill portion of the location to level the pad. Included in the pad construction would be excavation of the reserve and blow pits. Cut material from the reserve and burn pits would be stockpiled on the location or used to construct the back walls of the burn pit, which is where a gas flare is burned during drilling to relieve wellbore pressure.
2. Natural gas well drilling facility assembly would occur on the well pad after site clearing and leveling. Associated facilities and equipment utilized in this phase would include a drilling rig, generators, diesel engines, water tanks, mud tanks, safety stations, equipment and material storage units, blowout preventers, an accumulator station, and a gas buster. Water for the drilling would be obtained from a commercial source and trucked to the site.
3. The drill cuttings, drill water, and completion fluids would be placed in a lined reserve pit. The open reserve pit would be fenced on three sides away from the pad during drilling and the fourth side fenced as soon as the rig moves out. The reserve pit would be allowed to dry or the free fluids removed or trucked to an approved disposal facility or reused in drilling operations at another well site. In addition, any other production equipment or facility for which fluids are present shall be adequately fenced and properly maintained in order to safeguard both livestock and wildlife.
4. Pipeline construction activities include excavation of trenches, laying pipe, covering of pipe and leveling.
5. After the well is completed, a portion of the pad not required for production equipment and vehicular access, would be re-contoured and seeded. Approximately 1.0 acre for production facilities on the well pad would remain in use for production and vehicle

access. These areas would not be reclaimed until final abandonment of the well. Production equipment that would remain onsite would include the wellhead, production unit separator, and a meter run. Ancillary equipment such as a Christmas tree, compressor, pump jack, storage tank(s), dehydrator, and separator could also be installed at the well pad site. Equipment such as compressors or pump jacks would be powered by gas compression engines. No electric power line construction is proposed.

2.3 Alternatives Considered But Not Analyzed In Detail

During the planning stages of this project, representatives from Burlington met with representatives from the BLM and discussed possible alternative locations.

The proposed San Juan 29-7 Unit #86N natural gas well is designed to gain access to the mineral resources contained within the Blanco Mesaverde/Basin Dakota Formation in the west ½ of Section 17, Township 29 North, Range 07 West, NMPM. The proposed location was selected to reach the geological target within drill window and to utilize existing infrastructure to the greatest extent possible, thereby minimizing environmental impacts. Twinned gas wells and associated well pads are generally considered to be an option that creates the least amount of surface disturbance and minimizes impacts to resources. No other alternatives were identified during preliminary analysis and during the onsite meeting that would create less disturbance and still fulfill the purpose and need ofthe proposed action.



BURLINGTON RESOURCES OIL & GAS COMPANY

SAN JJAN 'IS-7 UNIT #86N

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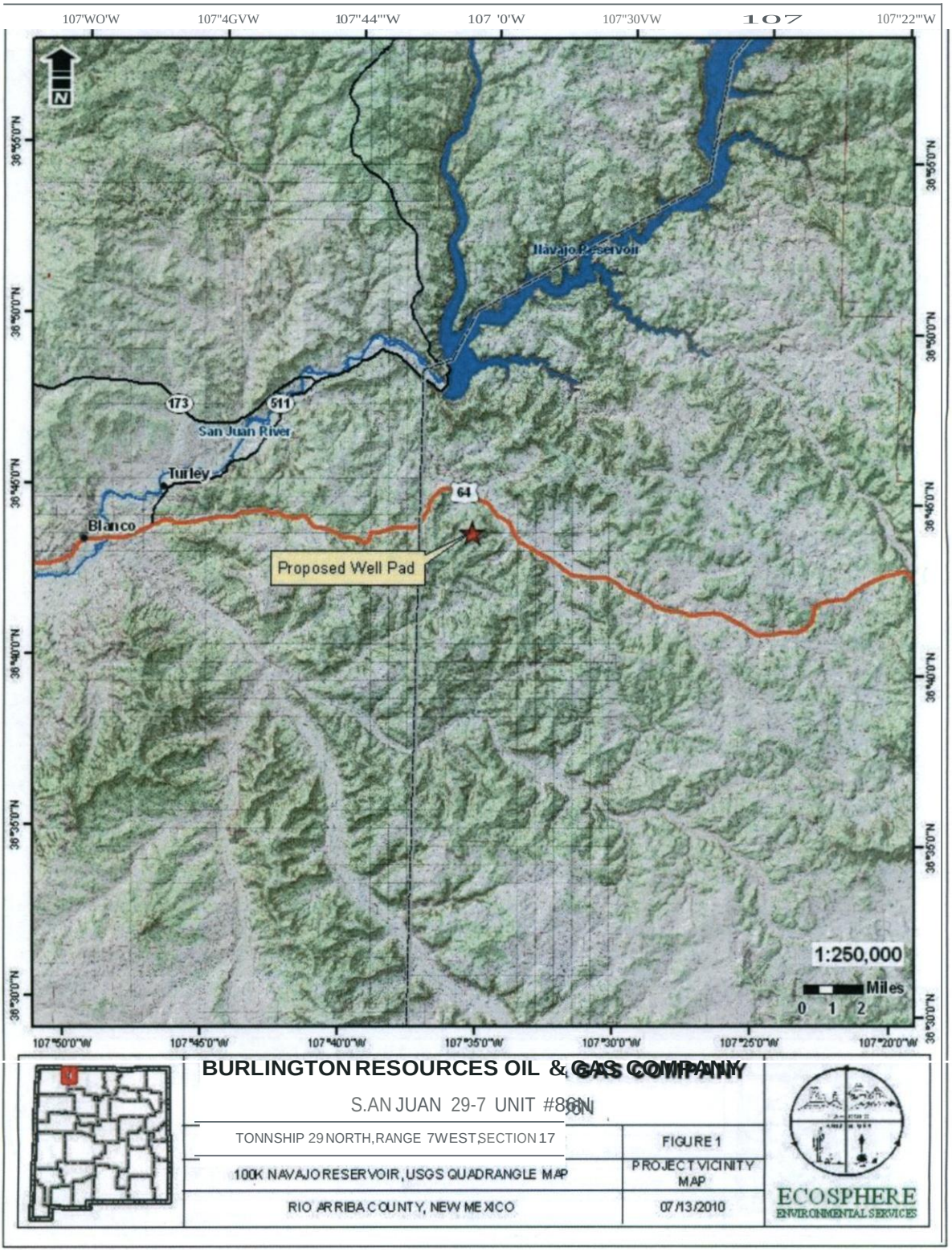
107'WO'W
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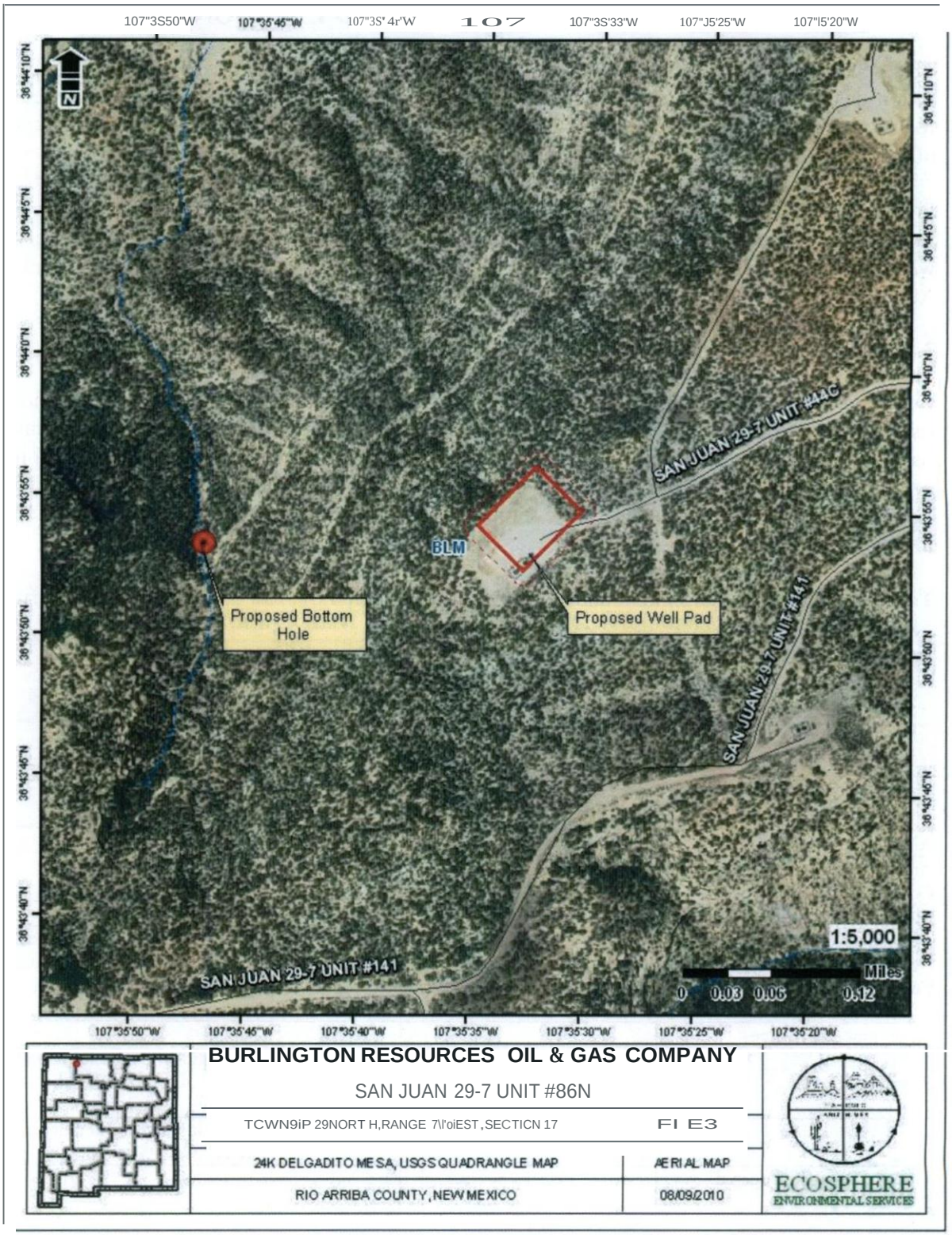
N
Navajo Reservoir
173
511
San Juan River
Turley
Blanco
64
Proposed Well Pad
1:250,000
Miles
0 1 2
107°50'0"W
107°45'0"W
107°40'0"W
107°35'0"W
107°30'0"W
107°25'0"W
107°20'0"W
BURLINGTON RESOURCES OIL & GAS COMPANY
S.AN JUAN 29-7 UNIT #86N
TONNSHIP 29 NORTH, RANGE 7WEST, SECTION 17
FIGURE 1
100K NAVAJO RESERVOIR, USGS QUADRANGLE MAP
PROJECT VICINITY MAP
RIO ARRIBA COUNTY, NEW MEXICO
07/13/2010
ECOSPHERE
ENVIRONMENTAL SERVICES


107"3S50"W
107"35'45"W
107"3S' 4r'W
107
107"3S'33"W
107"J5'25"W
107"l5'20"W
36"44'10"N
36"44'5"N
36"44'0"N
36"43'55"N
36"43'50"N
36"43'45"N
36"43'40"N
N
SAN JUAN 29-7 UNIT #44C
BLM
Proposed Bottom Hole
Proposed Well Pad
SAN JUAN 29-7 UNIT #141
SAN JUAN 29-7 UNIT #141
1:5,000
Miles
0 0.03 0.06 0.12
107"35'50"W
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3.0 DESCRIPTION OF AFFECTED ENVIRONMENT

This section describes the environment that would be affected by implementing the proposed action described in Section 2.0. Aspects of the affected environment described in this section focus on the relevant major resources or issues in the project area and vicinity. Only the aspects of the affected environment that are potentially impacted are described.

Field resource investigations of the proposed project area were conducted by a biologist from Ecosphere Environmental Services (Ecosphere) on June 23, 2010. Cultural resource surveys were conducted by Aztec Archaeological Consultants, LLC {AAC) on July 16, 2008 and on August 18, 2010.

3.1 Critical Elements

Certain critical environmental components require analysis under BLM policy (see Appendix 5 of H-1790-1 , NEPA Handbook). These requirements, listed in Table 1, are specified by statute, regulations, or executive order. Elements that do not exist in the project area or that do not have potential to be impacted are eliminated from further analysis as indicated in the table. Those elements potentially impacted by the proposed action or alternatives are described in the following sections.

Table 1. Affected Environment and Basis for Determination of No Further Analysis of Critical Elements.

CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT				
Resources	**Located in Project Area**	**Not Located in Project Area**	**Further Analysis Presented in Text**	**Basis for Determination**
Air Quality	X		X	
Areas of Critical Environmental Concern (ACECs)		X		The proposed project is not located within an ACEC.
Cultural Resources	X		X	
ative American Religious Concerns	X		X	No traditional cultural properties known to occur in the proposed project area. (Peggy Gaudy, oers. comm. 10/19/2010).
Environmental Justice	X		X	
Farmlands, Prime or Unique		X		No prime or unique farmlands located in project area or vicinity.
Floodplains		X		No floodplains located in project area or vicinity.
Threatened or Endangered Species		X	X	

CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT				
Resources	Located in Project Area	Not Located in Project Area	Further Analysis Presented in Text	Basis for Determination
Wastes, Hazardous or Solid		X	X	Due to the handling and storage of minor volumes of fuels and lubricants during construction, and due to the presence of existing oil and gas facilities in the project area, further analysis is warranted.
Water Quality, Surface/Ground	X		X	
Wetlands/Riparian Zones		X		No wetlands/riparian areas are located in the project area.
Wild and Scenic Rivers		X		There are no wild and scenic rivers in the FFO.
Wilderness		X		There are no designated Wilderness Areas within a 25 mile radius of the proposed project.

3.1.1 Air Resources

The proposed well is located in Rio Arriba County, New Mexico. Additional general information on air quality in the area is contained in Chapter 3 of the Farmington PRMP/FEIS. In addition to the air quality information in the PRMP cited above, new information about greenhouse gases (GHGs), and their effects on national and global climate conditions has emerged since this PRMP was prepared. On-going scientific research has identified the potential impacts of GHG emissions such as carbon dioxide (CO_2) methane (CH_4); nitrous oxide (N_2O); water vapor; and several trace gases on global climate. Through complex interactions on a global scale, GHG emissions may cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and burning of fossil carbon sources have caused GHG concentrations to increase measurably, and may contribute to overall climatic changes, typically referred to as global warming.

The 2003 PRMP discussed ozone in the Baseline Air Quality and Impact Assessment sections. The National Ambient Air Quality Standard (NAAQS) at the time was 0.084 ppm. In March of 2008, the USEPA announced a new primary 8-hour standard of 0.075 ppm.

Increased development in the Four Corners area including a proposed new coal fired power plant, increased oil and gas development, and population growth are all contributing to air quality concerns. Many residents are concerned with potential health impacts from other pollutants. An overall haze and plume of nitrogen oxides can often been seen in the skies, which impact visibility, and there are concerns for the ecosystem due to deposition of mercury and nitrogen.

In addition, the USEPA, on October 17, 2006, issued a final ruling on the lowering of the NAAQS for particulate matter ranging from 2.5 micron or smaller particle size. This ruling became effective on December 18, 2006, stating that the 24-hour standard for $PM_{2.5}$, was lowered to 35 ug/m^3 from the previous standard of 65 ug/m^3. This revised $PM_{2.5}$ daily NAAQS was promulgated to better protect the public from short-term particle exposure.

This EA incorporates an analysis of the contributions of the proposed action to GHG emissions, and a general discussion of potential impacts to climate.

Air quality and climate are the components of air resources, which include applications, activities, and management of the air resource. Therefore, the BLM must consider and analyze the potential effects of BLM and BLM-authorized activities on air resources as part of the planning and decision making process.

The USEPA has the primary responsibility for regulating air quality, including seven nationally regulated ambient air pollutants. Regulation of air quality is also delegated to some states of which New Mexico is one. Air quality is determined by atmospheric pollutants and chemistry, dispersion meteorology and terrain, and also includes applications of noise, smoke management, and visibility. Climate is the composite of generally prevailing weather conditions of a particular region throughout the year, averaged over a series of years. Greenhouse gases and the potential effects of GHG emissions on climate are not regulated by the USEPA, however climate has the potential to influence renewable and non-renewable resource management.

3.1.1.1 Air Quality

The area of the proposed action is considered a Class II air quality area. A Class II area allows moderate amounts of air quality degradation. The primary sources of air pollution are dust from blowing wind on disturbed or exposed soil and exhaust emissions from motorized equipment.

Air quality in the area near the proposed well is generally good and is not located in any of the areas designated by the USEPA as "non-attainment areas" for any listed pollutants regulated by the Clean Air Act. During the summers of 2000 through 2002, ozone levels in San Juan County were approaching non-attainment. Additional modeling and monitoring was conducted by Alpine Geophysics, LLC and Environ International Corporations, Inc., in 2003 and 2004. Results of the modeling suggest the episodes recorded in 2000 through 2002 were attributable to regional transport and high natural biogenic source emissions. The model also predicted that the region will not violate the ozone NAAQS through 2007 and that the trends in the 8-hr ozone values in the region will be declining in the future. At the present time, the San Juan County is classified as in attainment with the revised federal ozone standard of 0.075 ppm. Rio Arriba County is unclassified because there are no ozone monitors sited in Rio Arriba County.

Greenhouse gases, including carbon dioxide (CO_2) and methane (CH_4), and the potential effects of GHG emissions on climate, are not regulated by the USEPA under the Clean Air Act. However, climate has the potential to influence renewable and non-renewable resource management. The USEPA's Inventory of US Greenhouse Gas Emissions and Sinks found that in 2007, total U.S. GHG emissions were over 7 billion metric tons and that total U.S. GHG

emissions have increased by 17% from 1990 to 2007. Emissions increased from 2006 to 2007 by 1.4 percent (99.0 Tg CO2 Eq.). The following factors were primary contributors to this increase: (I) cooler winter and warmer summer conditions in 2007 than in 2006 increased the demand for heating fuels and contributed to the increase in the demand for electricity, (2) increased consumption of fossil fuels to generate electricity and (3) a significant decrease (14.2 percent) in hydropower generation used to meet this demand (USEPA 2009).

The levels of these GHGs are expected to continue increasing. The rate of increase is expected to slow as greater awareness of the potential environmental and economic costs associated with increased levels of GHGs result in behavioral and industrial adaptations.

3.1.1.2 Climate

Global mean surface temperatures have increased nearly 1.0°C (1.8°F) from 1890 to 2006 (Goddard Institute for Space Studies, 2007). However, observations and predictive models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of GHGs are likely to accelerate the rate of climate change.

In 2007, the Intergovernmental Panel on Climate Change (lPCC) predicted a warming of about 0.2°C per decade for the next two decades, and then a further warming of about 0.1 °C per decade. The National Academy of Sciences (2006) supports these predictions, but has acknowledged that there are uncertainties regarding how climate change may affect different regions. Computer model predictions indicate that increases in temperature will not be equally distributed, but are likely to be accentuated at higher latitudes. Warming during the winter months is expected to be greater than during the summer, and increases in daily minimum temperatures are more likely than increases in daily maximum temperatures.

A 2007 US Government Accountability Office (GAO) Report on Climate Change found that, "federal land and water resources are vulnerable to a wide range of effects from climate change, some of which are already occurring. These effects include, among others: l) physical effects such as droughts, floods, glacial melting, and sea level rise; 2) biological effects, such as increases in insect and disease infestations, shifts in species distribution, and changes in the timing of natural events; and 3) economic and social effects, such as adverse impacts on tourism, infrastructure, fishing, and other resource uses." It is not, however, possible to predict with any certainty regional or site specific effects on climate relative to the proposed action and subsequent actions.

In New Mexico, a recent study indicated that the mean annual temperatures have exceeded the global averages by nearly 50 percent since the 1970's (Enquist and Gori 2008). Similar to trends in national data, increases in mean winter temperatures in the southwest have contributed to this rise. When compared to baseline information, periods between 1991 and 2005 show temperature increases in over 95 percent of the geographical area of New Mexico. Warming is greatest in the northwestern, central, and southwestern parts of the state (Enquist and Gori 2008).

3.1.2 Cultural Resources

The project is located within the archaeologically rich San Juan Basin of northwestern New Mexico. In general, the prehistory of the San Juan Basin can be divided into five major periods: Paleo Indian (ca. 10000 B.C. to 5500 B.C.), Archaic (ca. 5500 BC to A.D. 400), Basketmaker II-III and Pueblo I-IV periods (A.D. 1-1540), and the historic (A.D. 1540 to present), which includes Native American as well as later Hispanic and Euro-American settlers. A detailed description of these various periods and select phases within each period is provided in the Farmington PRMP/FEIS (BLM 2003a).

The proposed San Juan 29-7 Unit #86N natural gas well is within the Gobernador sub-watershed. Based on the Farmington PRMP/FEIS (BLM 2003a), a total of 1,608 sites representing Archaic Period, Basketmaker II, Basketmaker III, Unknown Anasazi, Pueblo I, Pueblo II, Pueblo III, Pueblo IV, Unknown Navajo, Dinetah/Gobernador Phase, Cabezon Phase, Reservation Phase, Ute, Hispanic, and Euro-Anglo temporal/cultural components have been documented within the watershed. Of the 18 categories of sites defined based on temporal/cultural affiliation, 15 are represented. Lacking in the Gobernador sub-watershed sites attributed to Paleo, Apache and Pueblo occupations. The most frequently occurring cultural affiliations recorded are Dinetah/Gobernador Phase (41%) and Prehistoric Anasazi P I (21%). Site density is high with any apparent gaps most likely a factor of inventory, not a lack of sites.

AAC conducted a Class Ill cultural resource inventory of the proposed project under the BLM Cultural Resources Use Permits #202-2920-06-F and #202-2920-10-J. In conjunction with the field surveys of the project area, the investigation included a literature review of known resources within the project area. AAC conducted the literature review using available Geographic Information Systems (GIS) data from the Laboratory of Anthropology Archaeological Record Management Section (ARMS), the BLMIFFO, and the New Mexico Cultural Resource Information System data base. AAC ground surveyed a total of 7.3 acres on July 16, 2008 and revisited three sites in on August 18, 2010.

Three previously recorded archaeological sites, LA 125560, LA 125561, and LA 125562, were encountered during the 2008 AAC cultural resource survey for the proposed action. During the current investigation, AAC revisited sites LA 125560, LA 125561 , and LA 125562. Despite intensive efforts to relocate site LA 125560, no surface manifestation of the site were identified during the 2010 revisit to the site area. In 2008, limited auger testing within the site area yielded negative results. During the current investigation, site LA 125561 and LA 125562 were found to be in a similar state to their original recordings and the 2008 surveys. The BLM/FFO formally recommended these sites as NRHP eligible under criterion d in 1999. The cultural resources reports have been submitted to the BLM under separate report covers (AAC Report No. 2008-109 and 2010-051NM).

3.1.3 Native American Religious Concerns

There are several pieces of legislation and executive orders that are considered in an evaluation of Native American Religious Concerns [i.e., American Indian Religious Freedom Act (AIRFA)

of 1978, Executive Order 13007, The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990, and the Archaeological Resources Protection Act (ARPA) of 1979].

Traditional Cultural Properties (TCPs) are a separate class of cultural resources that may occur in the EA analysis area, may or may not coincide with archaeological sites and artifact loci, and may fall under the purview of one or more of the cited legislation. The National Park Service has defined TCPs as follows:

> A traditional cultural property can be defined generally as one (a property) that is eligible for the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. (National Register Bulletin 38)

For the proposed action, identification efforts for Native American Religious Concerns were limited to reviewing existing published and unpublished literature and personal communications with Peggy Gaudy, BLM/FFO archaeologist. No known TCPs are located within a mile of the project area.

3.1.4 Environmental Justice

Executive Order 12898 requires federal agencies to assess projects to ensure there is no disproportionately high or adverse environmental, health, or safety effects on minority and low-income populations. Minorities comprise a large proportion of the population residing inside the boundaries of the BLM/FFO (see pages 3-1 06 to 3-107 of the PRMP/FEIS for more details on ethnicity and poverty rates).

3.1.5 USFWS Threatened and Endangered Species

Under section 7 of the Endangered Species Act (ESA) of 1973 (as amended), the BLM is required to consult with the USFWS on any proposed action that may affect federally listed threatened or endangered species or species proposed for listing. The project Biological Survey Report (BSR) is provided in Appendix C and addresses the potential for federally listed and other special status species to occur in the project area. Table 2 summarizes the potential for federally listed species to occur in the project area.

No federally listed threatened, endangered, or candidate spectes, or potential habitats were identified within the proposed project area.

Table 2. Habitat Descriptions and Presence of USFWS listed Threatened (T), Endangered (E), or Candidate (C) species with potential to occur in Rio Arriba County, New Mexico.

SPECIES	STATUS	HABITAT ASSOCIATIONS	PRESENCE*
Black-footed ferret *(Mustela nigripes)*	E	Open grasslands with year-round prairie dog colonies.	p
New Mexico meadow jumping mouse *{Zapus hudsonius luteus)*	C	Nests in dry soils but uses moist, streamside, dense riparian/wetland vegetation.	p
Southwestern willow flycatcher *(Empidonax traillii extimus)*	E	Breeds 10 dense, shrubby riparian habitats, usually in close proximity to surface water or saturated soil.	p
Mexican spotted owl *(Strix occidentalis lucida)*	T	Nests in caves, cliffs, or trees in steep-walled canyons of mixed conifer forests.	NP
Yellow-billed cuckoo *(Coccyzus americanus)*	C	Nests in cottonwood/willow riparian habitat with dense understory along rivers; rare in the San Juan River valley.	NP
Least tern *(Sterna antillarum)*	E	Colonies found on bare or sparsely vegetated sand or dried mudflats along coasts or rivers; also sandy islands and gravel and sand_Qits.	p
Rio Grande silvery minnow *(Hybognathus amarus)*	E	Prefers large streams with slow to moderate currents over a mud, sand, or gravel bottom.	p
Rio Grande cutthroat trout *(Oncorhynchus clarkii virginalis)*	C	Prefers clear mountain streams or lakes with large substrate in the Rio Grande watershed.	NP

* K- Known, documented observatton wtthm proJect area; S -Habttat suttable and spectes suspected to occur wtthm the project area; NS -Habitat suitable but species is not suspected to occur within the project area; NP- Habitat not present and species unlikely to occur within the project area.

3.1.6 Wastes, Hazardous or Solid

The Resource Conservation and Recovery Act (RCRA) passed in 1976, establishes a comprehensive program for managing hazardous wastes from the time they are produced until their disposal. The USEPA regulations define solid wastes as any "discarded materials" subject to a number of exclusions. A "hazardous waste" is a solid waste that (1) is listed by the USEPA as a hazardous waste, (2) exhibits any of the characteristics of hazardous wastes (ignitability, corrosiveness, reactivity, or toxicity), or (3) is a mixture of solid and hazardous waste. A 1980, amendment to RCRA conditionally exempted from regulation as hazardous wastes "drilling fluids, production waters, and other wastes associated with the exploration, development, or production of crude oil or natural gas". On July 6, 1988, USEPA determined that oil and gas exploration, development and production (ED&P) wastes would not be regulated as hazardous wastes under RCRA. A simple rule of thumb was developed for determining if an ED&P waste is likely to be considered exempt or non-exempt from RCRA regulations: If (1) the waste came from down-hole, or (2) the waste was generated by contact with the oil and gas production stream during removal of produced water or other contaminants, the waste is most likely to be considered exempt by USEPA. The Comprehensive Environmental Response Compensation and Liability Act (CERCLA), passed in 1980, deals with the release (spillage, leaking, dumping, accumulation, etc.) or threat of a release of hazardous substances into the environment. Despite

many oil and gas constituent wastes being exempt from hazardous waste regulations, certain RCRA exempt contaminants could be subject to regulations as hazardous substances under CERCLA. The New Mexico Oil Conservat ion Division (OCD) administers hazardous waste regulations for oil and gas activities in New Mexico.

3.1.7 Water Quality, Surface and Groundwater

The project area is located in the Upper Colorado River Hydrologic Region and is part of the San Juan River Basin. The project area is located within the Gobemador sub-watershed (BLM 2003a). The nearest perennial water sources are Navajo Reservoir approximately 4.5 miles north of the project area and Cutter Dam, located approxi mately 6.1 miles west-southwest of the project area. There are no perennial water resources in the form of rivers, lakes, ponds or streams, nor any wetland, springs or riparian habitats within the proposed project area. A defined drainage, as shown on the 7.5-minute quadrangle map (Figure 2), occu rs about I,085 feet to the west-southwest of the proposed project.

The primary aquifers in the BLM/FFO area are the Uinta-Animas and the Mesaverde, which are sandstone based. Groundwater is readily available in most of the BLMIFFO area and is of fair to poor quality. A search of the New Mexico State Engineers Office - Water Administration and Technical Engineering Resource System (WATERS) database for the proposed project area and vicinity (!-mile radius) was performed. The database has no records of known water wells located with the proposed project area or a 1-mile radius (NMOSE 20I0).

3.2 Non-Critical Elements

Non-critical elements are resources that may be affected by the proposed action or alternatives, but are not necessarily required to be analyzed by statute, regulation, or Executive Order (EO). The non-critical eleme nts listed in Tab le 3 are either eliminated from further analysis in the table or are brought forward in this EA for analysis because they pertain to management objectives outlined in the BLM/FFO PRMP/FEIS (BLM 2003a).

Table 3. Affected Environment and Basis for Determination of No Further Analysis of Non-Critical Elements.

NON-CRITICAL ELEMENTS				
Resources	**Located in Project Area**	**Not Located in Project Area**	**Further Analysis Presented in Text**	**Basis for Determination**
Topography/Surface Geology	X		X	
Mineral Resources	X		X	
Paleontology		X	X	The project area is located within a PFYC designated Class 5 area.
Soils	X		X	
Vegetation, Fores!I"Y_	X		X	

Invasive, Non-native Species		X	X	
Livestock Grazing	X		X	
Special Status Species	X		X	
Wildlife	X		X	
Migratory Birds	X		X	
Wild Horses and Burros		X		There are no wild horse or burro populations in or near the project area.
Recreation	X		X	
Visual Resources	X		X	
Public Health and Safety	X		X	

3.2.1 General Topography/Surface Geology

The proposed project is located on the northeastern periphery of Manzanares Mesa. The canyon rim occurs about 220 feet from the proposed northwestern construction zone boundary. The mesa rises approximately 550 feet above the canyon below. Slope in the project area is relatively flat to mild at 0-2% with southern aspects. The elevation at the proposed project is 6,773 feet. Surface geology of the proposed project area is the San Jose Formation .

3.2.2 Paleontological Resources

The BLM uses the Potential Fossil Yield Classification (PFYC) system to identify areas with a high potential to produce significant fossil resources (IM 2008-009). This system has ranked all lands within the FFO management area as a Class 5 designation. Class 5 designations are described as being Very High Potential paleontological resource areas, thus requiring an assessment at the project level (IM 2008-0 II). The proposed project area is located within the paleontological-rich area of the San Juan Basin of northern New Mexico.

3.2.3 Mineral Resources

Natural gas production in the San Juan Basin is the highest in the state of New Mexico with approximately 650 to 700 million thousand cubic feet (Met) annually. The proposed natural gas well would produce natural gas from a valid existing federal lease for the minerals associated with the proposed development formation. The proposed well-tie pipeline would transport natural gas from the proposed natural gas well into the regional natural gas transmission system.

There are no coal mines or salable mineral extraction projects operating in the vicinity of the proposed project.

3.2.4 Soils

Soils in the San Juan Basin were formed primarily in two kinds of parent material: alluvial sediment and sedimentary rock. Alluvial sediment is material that was deposited in river valleys and on mesas, plateaus, and ancient river terraces. The material has been mixed and sorted in transport and is widely ranging in mineralogy and particle size. Sedimentary parent material consists mainly of sandstone and shale bedrock. These shale and resistant sandstone beds form prominent structural benches, buttes, and mesas bounded by cliffs.

The major soil mapping unit occurring within the proposed project area is the Yessilla-Menefee-Orlie complex, 1 to 30% slopes (USDA/NRCS 2007). The following description for this soil mapping unit is summarized from the Soil Survey of Rio Arriba Area, New Mexico, Part of Rio Arriba and Sandoval Counties (USDA/NRCS 2007).

Vessilla-Menefee-Orlie complex, 1-30% slopes: This soil mapping unit is found on mesas and plateaus and formed from breaks and hill slopes with elevations ranging from 6,100 to 7,200 feet. This unit is composed of 45% Yessilla, 25% Menefee, 20% Orlie, and 10% contrasting inclusions. The parent material for the Yessilla-Menefee-Orlie complex consists of slope alluvium over residuum weathered from sandstone, colluvium over residuum weathered from shale, and slope alluvium derived from sandstone and shale. Depth to a root restrictive layer for Yessilla and Menefee soil ranges from 10 to 20 inches, and up to 80 inches for Orlie soil. These soils are rarely flooded and not ponded (USDA/NRCS 2008). Table 4 summarizes the soil mapping unit characteristics.

Table 4. Soil Mapping Units and Parameters in the Proposed Project Area.

Soil Mapping Unit	Soil Name	Permeability	Available Water Capacity	Surface Runoff	Hazard of Water Erosion	Hazard of Soil Blowing
Vessilla-Menefee-Orlie complex, 1-30% slopes	Vessilla	moderately rapid	very low	medium	moderate	severe
	Menefee	slow	very low	medium	moderate	severe
	Orlie	moderately slow	very high	medium	moderate	slight

Soils in the proposed project have a pale brown color and range from sandy loam, clay loam, to silty loam in texture. Soils are extensively mixed and compacted from the construction and operation of the existing well. No biological soil crusts were observed in the proposed project area.

3.2.5 Vegetation, Forestry

The majority of the proposed project would be located on a reseeded community of herbaceous and woody plants associated with the reclamation of the existing well pad. Of the 3.03 acres of disturbance proposed for the project, approximately 0.76 acre consists of undisturbed vegetation, approximately 1.70 acres consists of disturbed/reclaimed vegetation, and approximately 0.57 acre consists of bare soil. The current vegetation in the disturbed portion of the project area forms a low to moderate cover and is dominated by Indian ricegrass *(Achnatherum hymenoides)* and crested wheatgrass *(Agropyron cristatum)*. Pinon-juniper *(Pinus edulis-Juniperus osteosperma)*, mountain mahogany *(Cercocarpus montanus)* and service berry *(Amelanchier utahensis)* dominate the undisturbed portion of the project area. Overall, the vegetative cover was visually estimated from 1-20%; however the existing well location is essentially devoid of vegetation. A total estimate of 30-40 trees is located within the undisturbed western-

northwestern portion of the proposed project area. A list of plants found during the field survey is included in the BSR in Appendix C.

3.2.6 Invasive, Non-native Species

The BLMIFFO maintai ns a list of invasive and non-native plant species of concern (BLM 2003a). None of the species listed by the BLM was observed in the proposed project area.

3.2.7 Livestock Grazing

The BLM/FFO manages 167 grazing allotments with 351 grazing authorizations that permit cattle *(Bos taurus)*, sheep *(Ovis aries)*, and horse *(Equus ferus cabal/us)* grazing within the resource area. Of the 351 grazing auth orizations, 317 are permitted under Section 3 of the Taylor Grazing Act. Of the 167 grazing allotments, there are four authorizations issued under Section 15 of the Taylor Grazing Act to the Navajo Tribe that authorize grazi ng on 35 allotments. Additional Section 15 authori zations permit grazing on 30 allotments in the Lindrith, New Mexico area.

The proposed project would be located on public lands within the BLM grazing allotment #5095 (Jesus Canyon AMP). This grazing allotment is permitted for a total of 480 animal unit months (AUM). Table 5 summarizes the per mitted grazing use on the allotment.

Table 5 Bureau ofLand Management Range Allotment m the Project Area.

Allotment	Livestock Type and Number	Period of Use	Animal Unit Months (AUM)
#5095	Cattle – 150	I1/15/20 I O – 02/28/20 I I	480

No evidence of catt le was observed within the proposed project area during the field survey. No permanent livestock water sources are within the project or action area.

3.2.8 Special Status Species

In accordance with BLM Manual 6840, the BLM manages certain sensitive species not federally listed as threatened or endangered in order to prevent or reduce the need to list them as threatened or endangered in the future. Special status species and their potential to occur in the proposed project area are listed in Table 6. The BSR in Appendix C provides the basis for the findings listed in the table.

Two BLM/FFO specia l status species have the potential to occur in the proposed project site and surrounding area, golden eagle *(Aquila chrysaetos)* and prairie falcon *(Falco mexicanus)*.

The topography and vegetation communities in the project and action area may provide potential foraging habitat for golden eagles. However, specific nesting features preferred by this raptor species are not found in the project area. Therefore, the occurrence of this species in the project area likely pertains to individuals flying over the site for foraging.

Similar to golden eagle, the project area provides potential foraging habitat for prairie falcon. There is not potential nesti ng habitat within the proposed project area. No golden eagles or prairie falcons were observed during the field survey. According to the BLM/FFO raptor nest geographic information system (GIS) data, no nests have been documented within l/3-mile radius of the proposed project area (BLM 2009, unpublished data).

Table 6. Habitat Descriptions, Status, and Presence of BLM/FFO Special status Species.

Species	Habitat Associations	Presence
Aztec gilia *(Aiiciella formosa}*	Salt desert scrub communities in soils of the Nacimiento Formation (5,000-6,000 ft).	NP
Brack's hardwall cactus *(Sclerocactus cloveriae* ssp. *brackii)*	Sandy clay of the Nacimiento Formation in sparse shadscale scrub (5,000-6,000 ft).	NP
Golden eagle *(Aquila chrysaetos)*	In the west, mostly open habitats in mountainous, canyon terrain. Nests primarily on cliffs and trees.	S
Burrowing owl *(Athene cunicularia)*	Rarely dig their own burrows and are typically associated with prairie dog colonies.	NP
Ferruginous hawk *(Buteo regalis)*	Flat or rolling terrain in grasslands, shrub-steppes, and deserts; may occur in the periphery of pinon-juniper or other forests. Badlands. Prefers elevated nest sites (e.g., buttes, utility poles, trees) but also nests on the ground.	p
Mountain plover *(Charadrius montanus)*	Breeds in flat, open grasslands; often associated with prairie dog towns and intensive grazing.	NP
Yellow-billed cuckoo *(Coccyzus americanus occidentalis)*	Breeds in riparian woodlands with dense understory vegetation.	NP
Prairie falcon *(Falco mexicanus)*	Found in arid, open grasslands and shrub-steppe habitats. Prairie falcons require cliffs for nesting.	S
American peregrine falcon *(Falco peregrinus anatum)*	Rugged terrain with rocky cliffs and canyons (30-1,000+ ft high), adjacent to rivers, lakes, or streams. Urban areas with towers and buildings are also inhabited.	NP
Bald eagle *(Haliaeetus leucocephalus)*	ests in forested areas adjacent to large bodies of water.	NP

K - Known, documented observation w1thtn proJect area; S - Habitat su1table and spec1es suspected to occur w1thtn the project area; NS - Habitat suitable but species is not suspected to occur within the project area; **NP** - Habitat not present and species unlikely to occur within the project area.

3.2.9 Wildlife

Big-game, and small and medium-sized mammals commonly found in the project area may include mule deer *(Odocoileus hemionus)*, elk *(Cervus elaphus)*, mountain lion *(Puma concolor)*, black-tailed jackrabbit *(Lepus californicus)*, desert cottontail *(Sylvilagus audubonii)*, ground squirrel *(Spermophilus* spp.), deer mouse *(Peromyscus maniculatus)*, white-tailed antelope squirrel *(Ammospermophilus leucurus)*, wood rat *(Neotoma* spp.), coyote *(Canis latrans)*, badger *(Taxidea taxus)*, kangaroo rat *(Dipodomys* spp.) and pocket gopher *(Thomomys* spp.).

During the June 23, 2010 biological survey, signs of mule deer and elk were observed in the proposed project area. A list of wildlife species observed within the proposed project area is provided in the project BSR in Appendix C.

3.2.10 Migratory Birds

Under the Migratory Bird Treaty Act (MBTA) (16 USC §703-712) and EO 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds", federal agencies are required to consider management impacts to migratory nongame birds. While all migratory songbirds are protected by law, certain species have been determined to be at greater risk than others. More than 350 avian species occur in San Juan County and the surrounding area administered by the BLM/FFO. A total of 136 species have been confirmed as breeding in San Juan County with likely additional species if one considers the adjacent counties within the FFO area. Data collected through breeding bird surveys coordinated by the USFWS as well as other private sector efforts have provided the basis for the New Mexico Partners in Flight (NMPIF) organization to develop bird "Watch Lists" and the USFWS's "Birds of Conservation Concern List". The NMPIF organization has identified priority species of birds for the state of New Mexico by habitat type. The FFO area lies within the Colorado Plateau physiographic region as identified by the NMPIF. The proposed project area contains two of the habitat types addressed in these documents: Great Basin desert shrub (sage/grass) and pinon-juniper woodland. Some of the birds listed as "Highest Priority" by the PIF group as well as USFWS "Birds of Conservation Concern" includes the ferruginous hawk *(Buteo regalis)*, gray vireo *(Vireo vicinior)*, pinon jay *(Gymnorhinus cyanocephalus)*, and juniper titmouse *(Baeolophus ridgwayi)*.

The pinon-juniper woodland habitat in and surrounding the proposed project area provides foraging and roosting habitat for large raptors, including golden eagles, prairie falcons, and red-tailed hawks *(Buteo jamaicensis)*. A variety of bird species may be found in the proposed project area such as Bendire's thrasher *(Toxostoma bendirei)*, loggerhead shrike *(Lanius ludovicianus)*, and vesper sparrow *(Pooecetes gramineus)*. Certain birds, including the juniper titmouse, western scrub jay *(Apelocoma californica)*, and bushtit *(Psaltriparus minimus)*, nest almost exclusively in pinon-juniper habitats. Mountain chickadees *(Parus gambeli)*, black-throated gray warblers *(Dendroica nigrescens)*, and blue-gray gnatcatchers *(Polioptila caerulea)* also occur in this community (NMPIF 2007).

The reclaimed habitat in the proposed project area provides foraging habitat for large raptors. Certain birds, including the vesper sparrow, sage sparrow *(Amphispiza belli)*, and sage thrasher *(Oreoscoptes montanus)*, nest almost exclusively in Great Basin desert shrub habitats. Black-throated sparrows *(Amphispiza bilineata)*, Brewer's sparrows *(Spizella breweri)* and mountain bluebirds *(Sialia currucoides)* also occur in this community (NMPIF 2007).

A list of avian species observed during the June 23, 2010 field survey of the proposed project area is included in the BSR in Appendix C.

3.2.11 Recreation

Recreation in the area consists of dispersed actiVIties such as hiking and hunting, cultural resource education, and horseback riding. There are no designated special recreation areas in proximity to the proposed action.

3.2.12 Visual Resources

The proposed project area is within the San Juan Basin, an area visually characterized by steep colorful escarpments, narrow vistas and rugged canyons. The proposed well would be twinned with an existing well. The vicinity consists of primarily Great Basin desert scrub and pinon-juniper woodland habitat.

The BLM has developed a Visual Resource Management (VRM) classification system designed to maintain or enhance visual qualities and describe the different degrees of modification to the landscape (BLM 2003). Visual Resource Management (VRM) on public lands is conducted in accordance with BLM Handbook 8410 and BLM Manual 8411. Further details of the FFO VRM Program are contained on pages 2-9 to 2-10 and 3-61 to 3-63 of the Farmington PRMP/FEIS. Modifications to the visual resource must follow the guidelines for the types of change suitable for each class. The proposed project area is located within a designated Class IV VRM area. This classification provides for activities that require major modification of the landscape and the level of change to the landscape can be high (BLM 2003a).

3.2.13 Public Health and Safety

The proposed natural gas well pad would be twinned with an operational gas well, and in the general vicinity of other existing natural gas well pads with pipeline ROWs, oil and gas facilities, and other developments. The proposed action is in an area connected by a network of dirt surface access roads. Public risk associated with natural gas development includes increased traffic on public roads, wildfire, pipeline leakage, rupture, fire and explosion. Additional public health and safety risks include spills of wastes, chemicals, or hazardous materials. Roads in the area are generally unimproved dirt surface and are used to access natural gas facilities. These roads may become hazardous or impassable during periods of inclement weather.

4.0 ENVIRONMENTAL CONSEQUENCES

Environmental resources can be affected in many ways during implementation of the proposed action. The effect, or impact, is defined as any change or alteration in the pre-existing condition of the environment produced by the proposed action, either directly or indirectly. This chapter analyzes the environmental consequences of the proposed action.

Impacts can be either long-term (permanent, residual) or short-term (incidental, temporary). Short-term impacts affect the environment for only a limited time period and the environment usually reverts rapidly to the pre-construction condition. Short-term impacts are often disruptive and obvious. Long-term impacts are substantial and permanent alterations to the pre-project environment. The BLM defines long-term impacts as those impacts whose results endure more than five years. Impacts may be irreversible or residual and affected resources irretrievable.

For the purpose of this EA, potential impacts have been divided into three categories:

> **High** - as defined in CEQ guidelines (40 CFR 1500-1508), impacts which are substantial in severity and therefore should receive the greatest attention in decision making.
>
> **Moderate** - impacts which cause a degree of change that is easy to detect, but do not meet the criteria for significant impacts.
>
> **Low** - impacts which cannot be easily detected and cause little change in the existing environment.

No Action Alternative

Under the no action alternative, the proposed natural gas well pad and pipeline would not be constructed, and the well would not be drilled. There would be no new impacts from oil and gas production to resources in the project area. The no action alternative would result in the continuation of the current land and resource uses in the project area. This alternative will not be evaluated further in Chapter 4.

Alternative B - Proposed Action

Under the proposed action, the San Juan 29-7 Unit #86N well pad would be constructed and the natural gas well would be directionally drilled as proposed. Mitigation measures would be implemented to reduce potential impacts to environmental resources. Total proposed surface disturbance would be 3.03 acres. There would be approximately 0.76 acre of new disturbance associated with the proposed action. Approximately 1 acre would be subject to long-term disturbance associated with the natural gas well pad. This long-term disturbance would overlap existing disturbance. The potential environmental consequences and proposed mitigation measures for this alternative are described for both critical and non-critical elements in the following sections.

4.1 Air Resources

4.1.1 Direct and Indirect Effects

Air Quality

Air quality would temporarily be directly impacted with pollution from exhaust em1ss1ons, chemical odors, and dust that would be caused by the motorized equipment used to construct the well pad and by the drilling rig that will be used to drill the well. Dust dissemination would discontinue upon completion of the construction phase of the well pad. Air pollution from the motorized equipment would discontinue at the completion of the drilling phase of the operations. The winds that frequent the northwestern part of New Mexico generally disperse the odors and emissions. The impacts to air quality would be greatly reduced as the construction and drilling phases are completed. Other factors that currently affect air quality in the area include dust from livestock herding activities, dust from recreational use, and dust from use of roads for vehicular traffic.

Over the last 10 years, the leasing of federal oil and gas mineral estate in the FFO has resulted in an average total of approximately 450 to 500 wells drilled on federal leases annually. These wells would contribute an incremental increase to the total emissions (including GHGs) from oil and gas activities in New Mexico.

Potential impacts of development could include increased air borne soil particles blown from new well pads or roads, exhaust emissions from drilling equipment, compressors, vehicles, and dehydration and separation facilities, as well as potential releases of GHG, NOx and YOCs during drilling or production activities. The amount of increased emissions cannot be quantified at this time since it is unknown how many wells might be drilled, the types of equipment needed if a well were to be completed successfully (e.g., compressor, separator, dehydrator), or what technologies may be employed by a given company for drilling any new wells. The degree of impact will also vary according to the characteristics of the geologic formations from which production occurs.

The reasonable and foreseeable development scenario developed for the FFO PRMP/FEfS demonstrated 522 wells would be drilled annually for federal minerals. Current APD permitting trends within the field office confirm that these assumptions are still accurate. This level of exploration and production would contribute a small incremental increase in overall hydrocarbon emissions, including GHGs, NOx, and YOCs released into the planet's atmosphere. When compared to total national or global emissions, the amount released as a result of potential production from the proposed well would not have a measurable effect on climate change due to uncertainty and incomplete and unavailable information; therefore is not possible to determine the effects on climate change on a regional, national, or global scale.

Consumption of oil and gas developed from the proposed well is expected to produce GHGs, NOx and VOCs. Consumption is driven by a variety of complex interacting factors including energy costs, energy efficiency, availability of other energy sources, economics, demography, and weather or climate. Regional and global transportation, metropolitan traffic, fires (including

wildfires, controlled burns and use of domestic fire places), and power plant emissions from the west are all parts of the equation. Regional air quality modeling conducted for the Northern San Juan Basin Coal Bed Methane FEIS Project in August 2006 determined that potential cumulative visibility impacts to Federal PSD Class l Areas (Mesa Verde National Park and the Weminuche Wilderness) could occur at some unspecified time in the future

The NAAQS are set for the most common and widespread pollutants. The standards are concentrations of air pollution above which the USEPA has determined that serious health and welfare consequences could occur. If the concentrations are below the NAAQS, there are no expected adverse effects to humans and the environment.

Climate

The assessment of GHG emissions and climate change is in its formative phase. It is currently not feasible to know with certainty the net impacts from the proposed action on climate. The inconsistency in results of scientific models used to predict climate change at the global scale coupled with the lack of scientific models designed to predict climate change on regional or local scales, limits the ability to quantify potential future impacts of decisions made at this level. When further information on the impacts to climate change is known, such information would be incorporated into the BLM's planning and NEPA documents as appropriate.

4.1.2 Mitigation Measures

The FFO has been a participant of the Four Corners Air Quality Task Force (FCAQTF) since its inception back in 2002 when it was known as the Four Corners Ozone Task Force. Because of the unanswered questions raised by these modeling efforts, the FCAQTF has continued to look at air quality issues in the Four Corners region. The FCAQTF is comprised of a broad base of representatives including federal, state, Indian, and local governments, as well as industry, interest groups, and concerned community members. The FCAQTF has several working groups that worked on the development of a mitigation options report (completed December 2007) to serve as a resource and guide to the regulatory agencies. The responsible agencies may use the report as the basis for developing air quality management plans for the region. This may include developing new and revising existing regulations, supporting new legislation, developing new outreach and information programs, and developing and/or expanding voluntary programs for emission reductions.

Additional air quality modeling conducted since completion of the 2003 FEIS/RMP and provisions in the ROD for the FEIS/RMP provide for applications of additional emission controls if requested by the NMAQB. Based on this modeling, the NMAQB issued an interim directive that all newly issued APDs limit compressor emissions to no more than 2 grams per horsepower hour of N_2O for engines of 300 horsepower or less. The FFO has complied with this directive through a COA that has been in effect since August 1, 2005. To date, NMAQB has made no other such requests.

Currently, development on Federal minerals in New Mexico's San Juan Basin is at a lower level than forecast in the Reasonable Foreseeable Development (RFD) Scenario prepared in 2001 for

the FFO PRMP/FEIS. The impacts forecast by the RFD are still valid. At the time the 2003 PRMP/FEIS was written ozone readings did not represent a violation of the NAAQS for this pollutant. The new preliminary 8-hour ozone design value for Navajo Lake site is (2006-2008) is at 0.075 ppm while the other two federal regulatory design-value monitors in San Juan County are; Substation (2006-2008) at 0.065 ppm and Bloomfield (2006-2008) at 0.071 ppm. A monitor design value must be greater than the revised 8-hour ozone standard of 0.075 ppm for a nonattainment designation.

The USEPA's inventory data describes "Natural Gas Systems" and "Petroleum Systems" as the two major categories of total US sources of GHG gas emissions. The inventory identifies the contributions of natural gas and petroleum systems to total CO_2 and CH_4 emissions (natural gas and petroleum systems do not produce noteworthy amounts of any of the other greenhouse gases). Within the larger category of "Natural Gas Systems", the USEPA identifies emissions occurring during distinct stages of operation, including field production, processing, transmission and storage, and distribution. "Petroleum Systems" subactivities include production field operations, crude oil transportation and crude oil refining. Within the two categories, the BLM has authority to regulate only those field production operations that are related to oil and gas measurement, and prevention of waste (via leaks, spills and unauthorized flaring and venting).

The BLM's regulatory jurisdiction over field production operations has resulted in the development of "Best Management Practices" (BMPs) designed to reduce impacts to air quality by reducing all emissions from field production and operations. Typical measures may include: flare hydrocarbon and gases at high temperatures in order to reduce emissions of incomplete combustion; require that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored; placement of compressors engines 300 horsepower or less must have NOx emissions limited to 2 grams per horsepower hour; revegetate areas of the pad not required for production facilities to reduce the amount of dust from the pads; and water dirt roads during periods of high use in order to reduce fugitive dust emission. The significance threshold for particulate matter of 35 ug/m^3 daily $PM_{2.5}$ NAAQS is not expected to be exceeded under the proposed action alternative.

The USEPA data show that improved practices and technology and changing economics have reduced emissions from oil and gas exploration and development (Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006). One of the factors in this improvement is the adoption by industry of the BMPs proposed by the USEPA's Natural Gas Energy Star program. The FFO will work with industry and NMAQB to help facilitate the use of the relevant BMPs for operations proposed on federal mineral leases where such mitigation is consistent with agency policy.

4.2 Cultural Resources

The cultural resources reports have been submitted to the BLM under a separate report cover.

4.2.1 Direct and Indirect Effects

The proposed undertaking will have *no effect* on historic properties in the area that site LA 125560 once existed. For this undertaking, no further archaeological investigations are warranted at the site LA 125560 area. During the current investigation, site LA 125561 and LA 125562 were found to be in a similar state to their original recordings and the 2008 AAC updates. The BLM-FFO formally recommended these sites as NRHP eligible under criterion d in 1999. These sites should be avoided during all construction activities. With the implementation of mitigation measures, no direct effects to these sites would be expected .

A potential indirect effect from the proposed action is the increase in human activity in the area with the increased possibility of unauthorized removal or other alteration to cultural resources in the area. BLM/FFO archaeologists will issue a cultural resource determination of effect for the proposed action. This determination would be included in the BLM/FFO cultural resources stipulations attached to the APD.

4.2.2 Mitigation Measures

Temporary fencing and monitoring during construction will be implemented. All BLM/FFO cultural resources stipulations will be followed as indicated in the Cultural Resource Records of Review, attached to the APD. Final project clearance and stipulations will be issued by the BLM/FFO.

If previously undocumented cultural sites are encountered during construction, all activities will stop in the vicinity of the discovery and the BLM will be immediately notified. The site would then be evaluated. Mitigation measures such as data recovery may be required by the BLM to prevent impacts to newly identified cultural resources.

4.3 Native American Religious Concerns

The proposed action is not known to physically threaten any TCPs, prevent access to sacred sites, prevent the possession of sacred objects or interfere or otherwise hinder the performance of traditional ceremonies and rituals pursuant to the American Indian Religious Freedom Act or E013007. Currently, no known remains fall within the purview of the Native American Graves Protection and Repatriation Act or the Archaeological Resources Protection Act.

4.3.1 Direct and Indirect Effects

Although none have been identified, any heretofore-unidentified effects of the proposed action to Native American Religious Concerns, direct and indirect, are expected to be low and long term.

4.3.2 Mitigation

No site-specific mitigation measures for Native American Religious Concerns have been recommended. In the event of any discoveries during project implementation, the BLM will be notified.

4.4 Environmental Justice

4.4.1 Direct and Indirect Effects

Development of the proposed action would not result in negative impacts to minority or low-income populations. No minority or low income populations would be directly affected in the vicinity of the proposed action. Indirect effects could include positive effects due to overall employment opportunities related to the oil and gas and service support industry in the region as well as the economic benefits to state and county governments related to royalty payments and severance taxes. A more detailed description of potential impacts is contained in the PRMP/FEIS p.4-120 and 4-129.

4.4.2 Mitigation Measures

No mitigation measures for Environmental Justice are recommended.

4.5 USFWS Threatened and Endangered Species

No USFWS listed species, or potential habitats, were found in the project area.

4.5.1 Direct and Indirect Effects

The BLM/FFO staff reviewed the proposed action and determined that it is in compliance with listed species management guidelines outlined in the September 2002 Biological Assessment (Cons. #2-22-0 1-1-389). No further consultation with the USFWS is required.

4.5.2 Mitigation Measures

No mitigation measures for USFWS threatened and endangered species are needed.

4.6 Wastes, Hazardous or Solid

Typical wastes associated with the proposed action include trash, sewage, produced water, and produced hydrocarbons. No chemicals subject to the Superfund Amendments and Reauthorization Act (SARA) Title III in amounts greater than 10,000 lbs will be used during project activities. No extremely hazardous substances as defined in 40 CFR 355 in threshold planning quantities will be used.

4.6.1 Direct and Indirect Effects

The potential for littering and hazardous leaks exists during construction and operation of the proposed project. The impacts from hazardous or solid waste would be minimal to non-existent in both the short and long term with adherence to the following mitigation measures.

4.6.2 Mitigation Measures

During drilling and completion, a trash receptacle and a chemically treated portable toilet will be on location for trash and sewer disposal. All produced hydrocarbons will be put in tanks on

location during completion work. Produced water will be put in onsite tanks or within lined reserve pit during completion work. All wastes will be disposed of I a proper manner as required by federal and state law and as described in the COAs

When significant amounts of chemicals are stored on-site, governmental agencies will be notified as required under the Emergency Planning and Community Right to Know Act (1986). The notification of releases such as natural gas, natural gas liquids, and petroleum outside the facility site is required under the CERCLA and under BLM NTL-3A. The well location will have an informational sign (43 CFR 3160).

4.7 Water Quality: Surface and Groundwater

Key factors that influence the surface water quality in the San Juan Basin drainage system include some or all of the following: sparse vegetative cover, highly erosive and saline soils, rapid runoff during storm events, livestock grazing, and mineral resource development.

No well defined intermittent or ephemeral drainages are located within the project area. There are no perennial surface water resources in the form of rivers, lakes, ponds or streams, nor any wetlands, springs, or riparian habitats, within the proposed project area. No water wells are located within a 1-mile radius of the proposed project.

4.7.1 Direct and Indirect Effects

The proposed action would temporarily expose (worst case) 3.03 acres of land as a sediment source entering local washes. Exposure of soils, particularly near washes and on slopes, would lead to an increase in an undetermined amount of sediment transport, particularly during and following storm events, due to moderate water erosion potentials. Slight alterations in project area drainage patterns may lead to an increase in sediment transport. These increases in sediment transport would persist for several years until the disturbed areas are stabilized. The potential for accidental spills or releases of hazardous materials (i.e., gas, diesel , etc.) used and stored on location exists and could impact local water quality.

The impacts to surface water quality due to short-term increases in sediment transport would be low as the surface water present at the project area is ephemeral. The potential for surface water quality impacts from accidental spills or releases of hazardous materials would be low and long-term. The impact of the proposed action on area water quality would be low in both the short and long-term. The proposed project is not expected to impact any groundwater resources.

4.7.2 Mitigation Measures

Burlington will implement aggressive revegetation following construction or at the direction of the BLM. These measures will help prevent erosion and sediment transport into drainages. Burlington will re-establish drainage to drain surface runoff to the west and prevent surface water from entering the proposed well pad. A silt trap will be constructed near comer 2 to reduce surface runoff velocities and sediment transfer. The construction zone will be recontoured and reclaimed following well completion.

Burlington maintains a hazardous material response contingency plan to cover eventualities that could arise from an accidental release of hazardous materials. Adequate casing, cementing, mud weights, blowout preventer and reserve pit volume will be stipulated in the COAs to mitigate any potential down-hole impacts to groundwater resources. Adherence to APD COAs and other mitigation measures will minimize potential impacts to water quality.

4.8 General Topography/Geology

The proposed action would be twinned with the existing San Juan 29-7 Unit #44C well. Portions of the proposed project has been leveled and contoured with slopes ranging from 0-2%.

4.8.1 Direct and Indirect Effects

A total of approximately 0.76 acre of undisturbed land would be impacted from construction of the proposed project. The construction of the proposed well pad would result a maximum of 7 feet of cut with 8 feet of fill. Alterations to topography from the removal of soils and rock within the proposed well pad would be low after recontouring and reseeding the periphery of the well pad. Changes in topographic relief would not likely be noticeable. Recontouring has the potential for slightly altering drainage patterns, generally in the short-term. Impacts to project area topography as a result of the proposed action would be low and long-term during operation. Impacts to topography are minimized by construction of the proposed action on existing disturbance.

Cross contamination between geological zones could occur without adequate cementing and casing of the proposed well bore. With implementation of FFO standard drilling and completion requirements, short and long-term effects to geology are anticipated to be low.

4.8.2 Mitigation Measures

Following well completion, areas not needed for operation will be recontoured and reseeded. Once the proposed well is abandoned, Burlington will recontour and reseed the remaining portions of the well pad in accordance with the COAs and stipulations issued by the BLM. Adequate casing, cementing, mud weight, blowout preventer and reserve pit volume will be issued by the BLM with the COAs to mitigate any potential down-hole impacts.

4.9 Paleontological Resources

The proposed project would be assessed individually based on BLM's PFYC system, GIS/Remote Sensing based locality data, known paleontological locality information, existing reports, and data for the area. If preliminary analysis indicates that the proposed project area has a high probability to fall within an appropriately designated class area, additional surveys, reporting, and stipulations would be required.

The San Jose Formation found within the proposed project area is not known to contain any paleontological resources. No fossils are known to occur within the proposed project area.

4.9.1 Direct and Indirect Effects

Although no paleontological resources are known to occur within the proposed project area, impacts to paleontological resources from the proposed project implementation could possibly occur. Direct impacts of the proposed project to fossil localities could result from the ground disturbing activities or the disturbance of the stratigraphic context in which they are located. This project could also create indirect impacts to areas by changing erosion patterns. An increase in human activity in the area could increase the possibility of unauthorized removal or other alterations to paleontological resources in the area. Potential impacts to paleontological resources as a result of the proposed action would be low and long-term.

4.9.2 Mitigation Measures

All BLM/FFO paleontological resources stipulations will be followed as indicated in the COAs, attached to the APD. These stipulations may include, but are not limited to, temporary or permanent fencing or other physical barriers, monitoring of earth disturbing construction, project area reduction and/or specific construction avoidance zones, and employee education. Upon review, a determination for final project clearance and stipulations shall be issued by the BLM/FFO.

If previously undocumented paleontological sites are encountered during construction, all activities shall stop in the vicinity of the discovery and the BLM will be immediately notified. The site will then be evaluated. Mitigation measures such as data recovery may be required by the BLM to prevent impacts to newly identified paleontological resources.

4.10 Soils

The soil mapping unit in the proposed project is the Vessilla-Menefee-Orlie complex. Soils in this complex are found on mesas and plateaus and formed from breaks and hill slopes.

4.10.1 Direct and Indirect Effects

Approximately 3.03 acres of soil would be exposed as a result of construction activities, resulting in temporary displacement, compaction, and mixing of soils. Approximately 1 acre of the well pad would remain as bare, compacted soil for the life of the project, approximately 30 years, and would be susceptible to an undetermined amount of wind and water erosion until the well is completely reclaimed.

The impact to project area soils as a result of the proposed action would be would be moderate and short-term during construction and low and long-term during operation. The potential for surface runoff rates for the soil found at the proposed project location is medium, and the hazard of water erosion potential is moderate. The hazard of soil blowing can be severe. The most susceptible period for soil erosion impacts is during construction when strong winds or precipitation events during soil disturbing activities could mobilize soils. Compaction of the soils during construction and operation of the proposed project, coupled with the implementation of mitigation measures described below, will limit soil impacts from erosion.

4.10.2 Mitigation Measures

Industry related vehicle and pedestrian traffic will be restricted to permitted areas and existing roads. Following construction activities, unused areas will be reseeded with a BLM approved seed mix to stabilize soils and prevent erosion. Following construction, vehicle traffic will be restricted to existing bladed roads to prevent erosion, soil mixing, and compaction in adjacent areas. A silt trap will be constructed near corner 2. Culverts will be installed as needed, directing drainage off of the road and into vegetated areas where it can infiltrate into the ground and/or sediment will settle out on the surface. Implementation of proper soil salvage, storage, and reclamation will retain adequate infiltration and permeability rates that will allow for maintenance of soil moisture, which is necessary for plant growth and vigor, and minimize surface runoff.

4.11 Vegetation, Forestry

The vegetation communities in the proposed project area include reclaimed herbaceous and woody plants and pinon-juniper woodland.

4.11.1 Direct and Indirect Effects

Construction of the proposed action would result in the disturbance of approximately 1.70 acres of vegetation. Approximately 0.76 acre of undisturbed vegetation would be removed by the proposed action. Approximately 30-40 trees would be removed by the proposed action.

The degree of impact would depend on the type and amount of vegetation impacted, the duration of the disturbance, and the rate at which the vegetation would regenerate after reclamation. Wood land areas would take decades to return to current conditions. The impact of the proposed action on area vegetation would be low and short to long-term. Direct effects would include the short-term loss of vegetation and the long-term modification of species composition and extent of cover types. Indirect effects and potential impacts may include the short- and long-term increased potential for introducing invasive, non-native species into the area, exposure of soil and increased soil erosion, and a reduction in the quality of wildlife habitat.

4.11.2 Mitigation Measures

During construction, Burlington and their contractors' vehicles will only operate on areas identified in this EA as work areas and on existing roadways. Revegetation of the construction zone will be initiated by Burlington immediately following construction or at the direction of the BLM. The area will be reseeded with a BLM approved seed mixture as shown in Table 7. All rates shown are for pure live seed (PLS). The amount of seed is for drilled rate, for broadcast applications the rate will be doubled. Approximately 2 acres will be revegetated following well completion. Monitoring for invasive plants and appropriate control/eradication measures will be done in conjunction with the BLM and other required permits/agencies. Trees will be cut, stacked and mowed and incorporated into the revegetation process.

Table 7. Farmmgton Field Office Seed Mix.

Common Name	Variety	Percent for Mix	Pure Live Seed Lbs/Acre
Western Wheatgrass	Arriba	23%	3.0
Indian Ricegrass	Paloma or Rimrock	23%	3.0
Slender Wheatgrass	San Luis	15%	2.0
Crested Wheatgrass	Hy-Crest	22%	3.0
Bottlebrush Squirreltail		15%	2.0
Four-wing Saltbush		2%	2.0

Source: BLM 2006

Alternative Species for Consideration:

Grass: Alkali sacaton (for clayey and salty bottoms)
Needle and thread
Pubescent wheatgrass
Intermediate wheatgrass
Smooth brome (for higher elevati ons)

4.12 Invasive, Non-native Species

No BLM listed invasive, non-native species of concern were identified in the project area.

4.12.1 Direct and Indirect Effects

Surface disturbance activities associated with the proposed project create potenti al for the establishment and spread of noxious weeds and invasive, non-native species. The proposed project would have low and long-term impact from the potenti al introduction of invasive, non-native species into the area.

4.12.2 Mitigation Measures

Appropriate washing of vehicles entering the project area will reduce the potential for invasive and non-native plant species infestations. Proper seeding and monitoring of the disturbed areas will reduce the potenti al for invasive species to establish. Adherence to BLM reclamation measures will minimize impacts from invasive, non-nati ve species. Monitoring for invasive plants and appropriate control/eradication measures will be done in accordance with standard and project specific BLM stipulations.

4.13 Livestock Grazing

4.13.1 Direct and Indirect Effects

Surface-disturbing activities associ ated with constructi on of the proposed acti on would remove a limited amount of forage. Approx imately 0.76 acre of undisturbed vegetation, 1.70 acres of disturbed/reclaimed vegetation and approximately l acre of bare so il would be directly impacted by the proposed action resulting in minor reduction in forage and a change in the vegetation species compos1t10n. The direct short-term loss and impact to grazing is estimated to be approx imately 0.15 of a federal AUM (at an estimated 20 acres per AUM). This impact would

last until successful reclamation of the disturbed area has occurred. There would be a long-term loss of an estimated 1 acre of potential forage resources (0.08 AUM) for areas needed for operation and maintenance. This loss would overlap existing disturbance thereby minimizing impacts. Cattle grazing would continue on the lease during development and operations. The reclaimed areas associated with the proposed action would typically recover to the level before disturbance in about 3 to 5 years. Reseeded sites often produce more livestock forage then native habitat due to the seed mix content.

Potential indirect impacts to livestock include an increase in human activity, noise, and traffic. Pad construction and drilling activities are not expected to conflict with grazing use of the area.

4.13.2 Mitigation Measures

Reseeding will reduce impacts to livestock grazing. Control of invasive weeds during construction and operation of the proposed project will be important for controlling further habitat degradation to the affected allotment. Burlington will fence around the reserve pit during drilling precluding livestock and big game from utilizing this water source.

4.14 Special Status Species

In accordance with BLM Manual 6840, the BLM manages certain sensitive species not federally listed as threatened or endangered in order to prevent or reduce the need to list them as threatened or endangered in the future. The BSR in Appendix C provides the basis for the findings listed in the table. Two BLM special management status species have the potential to occur in the project and action area, golden eagle and prairie falcon.

4.14.1 Direct and Indirect Effects

Direct impacts to golden eagles and prairie falcons as a result of the proposed project would include the removal and modification of approximately 0.76 acres of undisturbed potential foraging and perching habitat. There would be no impacts to potential nesting habitat. This would include the removal of approximately 30-40 trees. Approximately 2 acres of the total 3.03 permitted acres would be reclaimed following construction of the proposed project. Additional impacts may include avoidance of the project area by golden eagles and prairie falcons during construction, drilling, and operation due to disturbance and activity from human and vehicle presence and associated noise. Impacts from loss or modification of habitat and avoidance would be low and long-term. Indirect impacts may include a change in vegetation species composition and density due to surface disturbance and reclamation, which could affect the prey base for golden eagles and prairie falcons. Indirect impacts would be low and long-term.

4.14.2 Mitigation Measures

Adherence to COAs and stipulations provided by the BLM will minimize effects to all raptors that may utilize the project and action areas for foraging. Should any nesting raptors be identified before or during construction activities, the BLM biologist will be immediately contacted in order to evaluate whether additional resource protection measures are warranted.

4.15 Wildlife

4.15.1 Direct and Indirect Effects

During construction activities, wildlife (big-game, small and medium-sized mammals) in the proposed project and adjacent areas would be temporarily displaced and would likely vacate the area due to human and vehicular activity and the associated noise. At this time, wildlife such as mule deer and elk would continue to pass through the proposed project area, yet are also likely to modify movement patterns around the proposed project to avoid humans and traffic. Some burrowing animals may be killed or displaced and their burrows destroyed during construction activities. Once the proposed project is completed, wildlife would likely return to the proposed project area.

Construction of the proposed action would result in the removal of approximately 0.76 acre of undisturbed vegetation and 1.70 acres of reclaimed herbaceous vegetation. Since the vegetation removed would not necessarily be replaced with the same species and in the same percentage, habitat modification is anticipated. A minor loss of big game foraging habitat and cover would result from the implementation of the proposed action. Impacts to wildlife are minimized by construction of the proposed action on existing disturbance.

Impacts to wildlife would be low to moderate in the short-term during construction and drilling. Impacts during operation would be low and long-term. Impacts to wildlife are minimized by construction of the proposed action on existing disturbance.

4.15.2 Mitigation Measures

Construction activities will be confined to the permitted area to avoid further disruption to wildlife. Adherence to BLM reclamation and sanitation measures will also minimize potential impacts to wildlife. The area will be reseeded with an FFO seed mix. A silt trap will be constructed near corner 2.

4.16 Migratory Birds

Executive Order 13186 dated January 17,2001 calls for increased efforts to more fully implement the MBTA. In keeping with this mandate, the BLM/FFO has consulted the PIF Bird Conservation Plan for the State of New Mexico and the USFWS list of Birds of Conservation Concern. A review of these documents, specifically as they pertain to the Colorado Plateau physiographic area, indicates there are three ·'priority" avian species (with a known range of distribution in the FFO area) that utilize the pinon-juniper woodland habitat type and eight "·priority" species that utilize the sagebrush/grass within the Great Basin desert shrub habitat type that occur on the NMPIF "Highest Priority" and USFWS "Birds of Conservation Concern 2008" lists. Nine of these species occur on both lists. Various types of perturbations and or anthropogenic activity may affect these species. These species and a brief assessment of the effects of the proposed action on their habitat are provided in Table 8.

Table 8. Migratory Bird Species of Concern Occurring within the BLMIFFO and Potential Impacts.

Species	Habitat Type	Effects	Impact Rating Low/Moderate/High
Grasshopper sparrow *(Ammodramus savannamm)*	sage/grass	May be positively affected due to conversion to grassland.	Low
Sage sparrow' *(Amphispiza belli)*	sage/grass	Minor loss of nesting and brood rearing habitat.	Low
Burrowing owl *(Athene cunicularia)*	sage/grass	Little effect, nests in abandoned prairie dog burrows.	Low
Mountain plover *(Charadrius montanus)*	sage/grass	May be positively affected due to conversion to grassland; may produce more prey (i.e. arthropods}.	Low
Long-billed curlew *(Numenius americanus)*	sage/grass	May be positively affected due to conversion to grassland.	Low
Sage thrasher' *(Oreoscoptes montanus)*	sage/grass	May be some loss of sage/nesting habitat.	Low
Bendire's thrasher *(Toxostoma bendirei)*	sage/grass	Little effect anticipated some loss of nesting habitat; increase in prey (i.e., arthropods) likely.	Low
Juniper titmouse *(Baeolophus ridgwayi)*	pinon-juniper	Secondary cavity nester; some loss of nesting habitat.	Low
Pinon jay *(Gymnorhinus cyanocephalus)*	pinon-juniper	Colony nester in pinon; loss of pinon may impact.	Low
Gray vireo *(Vireo vicinior)*	pinon-juniper	Nests in juniper; reduction of juniper may be detrimental.	Low

= "Htgh Pnonty" btrd spectes that are ltsted on the NMPIF "Htghest Pnonty" btrds of conservatton concern ltst but not on the USFWS "Birds of Conservation Concern 2008" list.

4.16.1 Direct and Indirect Effects

Direct and indirect impacts to migratory birds of concern would be low and short to long-term given the level of existing disturbance in the project area. Impacts to those species associated with pinon-juniper woodland would occur from the removal of 0.76 acre of undisturbed vegetation and 30-40 trees. Impacts to migratory birds could be greater should construction occur during the breeding season of April 15 through July 15 when construction activities may cause some nest abandonment in adjacent areas.

4.16.2 Mitigation Measures

Construction activities will be confined to the proposed project area to avoid further disruption to migratory birds. Adherence to BLM reclamation and sanitation measures will minimize potential impacts. Following construction activities, disturbed areas will be reseeded with the appropriate BLM seed mix. Any spills will be promptly cleaned up and Burlington will prepare a hazardous material response contingency plan to cover eventualities, which could arise from an

accidental release of hazardous materials. Reserve pits will be fenced and any open cavities will be covered. Any bird nests found within the proposed project area must be reported to a BLM/FFO biologist for appropriate mitigation prior to construction activities.

4.17 Recreation

There are no designated recreational areas within the proposed project area or immediate surroundings. The proposed project area does offer opportunities for dispersed recreational activities.

4.17.1 Direct and Indirect Effects

During construction and drilling, recreationists may experience an increase in traffic, fugitive dust, and sound levels, as well as nighttime lighting. The proposed action would have low and short-term impacts to recreation opportunities during construction and operation of the well. Impacts would be low for the long-term.

4.17.2 Mitigation Measures

Suspended dust during construction activities will be reduced through the application of fresh water to disturbed areas and heavy vehicle traffic areas. Construction activities will be confined to the proposed project area. Adherence to BLM reclamation and sanitation measures will minimize potential impacts. Following construction activities, disturbed areas will be reseeded with the appropriate BLM seed mix. Any spills will be promptly cleaned up and Burlington will prepare a hazardous material response contingency plan to cover eventualities, which could arise from an accidental release of hazardous materials.

4.18 Visual Resources

The proposed project is located within the boundary of an area designated as Class IV VRM.

4.18.1 Direct and Indirect Effects

During construction and drilling operations, the effect of disturbed ground, machinery emissions, and the presence of the drill rig and construction equipment would result in low to moderate short-term visual impacts. After construction, the presence of above ground equipment associated with well operation and natural gas production would result in long-term visual impacts.

4.19.2 Mitigation Measures

A rapid construction schedule will minimize impacts to visual resources that result from construction activities. Mitigation measures that will minimize the visual impact of the project include revegetation and above-ground facility paint color requirements established by the BLM. Low profile equipment will be installed.

4.19 Public Health and Safety

The proposed project may impact public health and safety in a number of ways. The primary activities associated with public health and safety include traffic and transportation to/from the site, and handling, storage, and operation of equipment associated with construction activities. Health and safety issues for construction workers include operation of heavy equipment, welding activities, and working in the vicinity of other utilities (primarily other oil and gas gathering pipelines).

4.19.1 Direct and Indirect Effects

Direct and indirect impacts on public health and safety will be low to moderate and short-term during construction and drilling. Impacts during operation would be low and long-term.

4.19.2 Mitigation Measures

Adherence to company safety policies and BLM COAs will provide mitigation for public health and safety. In addition, hauling equipment and materials for the project on public roads would comply with all Department of Transportation regulations. All drilling and equipment operation would be performed in compliance with appropriate Occupation Health and Safety Administration (OSHA) regulations.

4.20 Cumulative Effects

The leased area of the proposed action has been industrialized with oil and gas well development. The surface disturbance for each project that has been permitted has created a spreading out of land use fragmentation. The cumulative impacts fluctuate with the gradual reclamation of well abandonments and the creation of new additional surface disturbances in the construction of new access roads and well pads. The on-going process of restoration of abandonments and creating new disturbances for drilling new wells gradually accumulates as the minerals are extracted from the land. Preserving as much land as possible and applying appropriate mitigation measures will alleviate the cumulative impacts.

Due to the absence of regulatory requirements to measure GHG emissions and the variability of oil and gas activities on federal minerals, it is not possible to accurately quantify potential GHG emissions in the affected areas as a result of approving this application for permit to drill. A general assumption, however, can be made: drilling this well may contribute to GHG emissions.

The lack of scientific tools designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts. However, potential impacts to natural resources and plant and animal species due to climate change are likely to be varied, including those in the southwestern United States. For example, if global climate change results in a warmer and drier climate, increased particulate matter impacts could occur due to increased windblown dust from drier and less stable soils. Cool season plant species' spatial ranges are predicted to move north and to higher elevations, and extinction of endemic threatened/endangered plants may be accelerated.

Due to loss of habitat or competition from other species whose ranges may shift northward, the population of some animal species may be reduced or increased. Less snow at lower elevations would likely impact the timing and quantity of snowmelt, which, in turn, could impact water resources and species dependant on historic water conditions. Forests at higher elevations in New Mexico, for example, have been exposed to warmer and drier conditions over a ten-year period. Should the trend continue, the habitats and identified drought sensitive species in these forested areas and higher elevations may also be more affected by climate change.

5.0 CONSULTATION/COORDINATION

This section includes individuals or organizations from the public, public land users, the interdisciplinary team, and permittees that were contacted during the development of this document.

Table 9. Consultation and Coordination During the Analysis and Document Preparation.

Public Contact	Title	Organization	Present at Onsite?
Dollie Busse	Construction Technician-Projects Development	Burlington	o
Steven Merrell	Construction Supervisor	Burlington	Yes
Mike Flaniken	Environmental Protection Specialist	BLMIFFO	Yes
Peggy Gaudy	BLM Archaeologist	BLMIFFO	No
John D. Cater	Archeologist	AAC	o
Kennon Decker	Grazing Leasee	Private	o
Theresa Ancell	Biologist	Ecosphere	Yes
Toinette Slowman	Biologist	Ecosphere	Yes

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APPENDIX A

APPLICATION FOR PERMIT TO DRILL (APD)

APPENDIX B

CONDITIONS OF APPROVAL (COA)

APPENDIXC

BIOLOGICAL SURVEY REPORT