ENVIRONMENTAL ASSESSMENT
(2nd Revision)

for the

San Juan 29-7 Unit No. 82M Well Pad and Pipeline Tie

Burlington Resources Oil and Gas Company, LP
Enterprise Field Services, LLC

BLM EA No. NM-F010-2011-236

Bottom Hole Location:
1920' FSL & 500' FEL

Surface Location:
775' FSL & 1535' FEL,
Section 04, Township 29 North, Range 07 West,
New Mexico Principal Meridian,
Rio Arriba County, New Mexico

U. S. Department of the Interior
Bureau of Land Management
Farmington Field Office

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BUREAU OF LAND MANAGEMENT
FARMINGTON FIELD OFFICE

ENVIRONMENTAL ASSESSMENT FOR THE BURLINGTON RESOURCES OIL AND GAS COMPANY San Juan 29-7 Unit No. 82M Well Pad and Pipeline Tie

1.0 Introduction

1.1 The Proposal

Burlington Resources Oil and Gas Company (Burlington) has an application for permit to drill (APD) with the Bureau of Land Management, Farmington Field Office (BLM-FFO) for one Basin Dakota/Blanco Mesaverde gas well, the San Juan 29-7 Unit No. 82M. Thproposed action would include the construction of a well pad, the drilling and production of a well, the usage of the well pad throughout the life of the well, and the final abandonment of the well and well pad. Enterprise Field Services, LLC (Enterprise) would construct, operate, and finally abandon an associated pipeline tie, which would be necessary to transport gas from the proposed well.

The proposed action area would be on surface managed by the BLM-FFO. The minerals associated with the proposed action are also managed by the BLM-FFO. The BLM is authorized under the Mineral Leasing Act of 1920 (MLA), as amended (30 United States Code [USC] 181 et seq.), to issue oil and gas leases for exploration and development. Minerals extracted as a result of the proposed action would be associated with a valid, existing gas lease, NMSF 0078919, issued in 1948. Burlington is the lessee of record and has operating rights for the lease.

Per 40 Code of Federal Regulations (CFR) 1508.28 and 1502.21, this site-specific Environmental Analysis (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) and the Farmington Resource Management Plan (RMP), approved per the September 29, 2003 Record of Decision (ROD). The RMP with ROD is available for review at the BLM-FFO (Farmington, New Mexico) or at www.nm.blm.gov/ffo/ffo home.html. This EA addresses site-specific resources and effects of the proposed action that were not specifically covered within the PRMP/FEIS, as required by the National Environmental Policy Act of 1969 (NEPA), as amended (Public Law 91-90,42 United States Code [USC] 4321 et seq.).

1.2 Purpose and Need

The need for the BLM to approve the proposed action is to comply with an existing gas lease, which constitutes a binding legal contract.

The purpose of approving the proposed action is to authorize Burlington, via an APD, to construct, drill, operate, and finally abandon the proposed well and any associated facilities. These activities would allow production of Basin Dakota/Blanco Mesaverde gas from the lease.

1.3 Conformance with Applicable Land Use Plan and Other Environmental Assessments

The regulations under 43 CFR 1610.5 require the proposed action to be in conformance with the terms and the conditions of the Farmington RMP. The Federal Land Policy and Management Act of 1976 (FLPMA) established guidelines to provide for the management, protection, development, and enhancement of public lands (Public Law 94-579, 43 USC 1701 et seq.). Under this authority, Specially Designated Areas (SDAs) and Areas of Critical Environmental Concern (ACECs) are identified in the RMP. The proposed action area is within Frances Mesa Cultural ACEC. This ACEC is discussed in detail in Sections 3.9 and 4.9, Areas of Critical Environmental Concern.

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

ConocoPhillips and Enterprise would comply with all applicable Federal and State of New Mexico laws and regulations (Appendix A). Non-point source pollution is an identified problem in the planning area that is directly associated with soil stability and water quality. The New Mexico Energy, Minerals and Natural Resources Department requires operators to follow "pit rule" guidelines contained within NMAC 19.15.17 in an effort to reduce groundwater contamination from industry related activities. Mandated by the Clean Water Act (CWA), efforts to reduce non-point source pollution through implementation of erosion control and management practices are an important part of the BLM's management activities. Industrial activities disturbing land may require permit coverage through a National Pollution Discharge Elimination System (NPDES) stormwater discharge permit. Oil and gas development, however, is exempt from NPDES regulation per 40 CPR Part 122. A U.S. Army Corps of Engineers Section CWA 404 Permit for the discharge of dredge and fill materials may also be required. Operators are required to obtain all necessary permits and approvals prior to any disturbance activities.

Consultation with the U.S. Fish and Wildlife Service (USFWS), as required by Section 7 of the Endangered Species Act, was conducted as part of the Farmington PRMP/FEIS (Consultation No. 2-22-01-1-389) to address cumulative effects of RMP implementation. The consultation is summarized in Appendix M of the PRMP/FEIS. Review of current USFWS Federally Listed Species and an onsite evaluation of habitat for the proposed action indicate no need for additional Section 7 consultation.

Compliance with Section 106 responsibilities of the National Historic Preservation Act are adhered to by following the BLM–New Mexico State Historic Preservation Officer (NM SHPO) 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.

The State of New Mexico Oil Conservation Commission (NMOCC) has assigned spacing rules for producing oil and gas formations. Current spacing for the Basin Dakota and Blanco Mesaverde formations is 320 acres per four wells.

Additionally, ConocoPhillips would:

- Comply with all applicable Federal, State of New Mexico, and local laws and regulations. A listing of selected Federal laws and regulations applicable to the proposed action can be found in Appendix A.
- Obtain applicable permits for the construction, drilling, completion, production, and final abandonment of this well including water rights appropriations, water discharge permits, relevant air quality permits, and permits associated with the installation of water management facilities.

2.0 Alternatives Including the Proposed Action

2.1 Alternative A- No Action

The No Action Alternative provides a reference, enabling decision makers to compare the magnitude of environmenta l effects of the alternatives. The BLM NEPA Handbook (H-1790-1) states that for EAs on 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 3162.3-1(h)(l). The No Action Alternative would deny the approval of the proposed APD. The well would not be drilled, and current land and resource uses wou ld continue to occur in the proposed action area. No mitigation measures would be required.

2.2 Alternative B - Proposed Action

2.2.1 General Location and Description

Burlington has proposed the drilling, production, and final abandonment of a natural gas well and the construction, operation, and final abandonment of an associated well pad. Enterprise has proposed the construction, operation, and final abandonment of an associated pipeline tie. The action is proposed for 2011 or 2012.

The San Juan 29-7 Unit No. 82M is proposed to be developed in the San Juan Basin of northwestern New Mexico, approximately 14.2 miles east-northeast of the town of Blanco (see Figure 1, page 5). The proposed project area is plotted on the Delgadita Mesa, New Mexico, 7.5-minute United States Geological Service (USGS) quadrangle map (see Figure 2, page 6). The proposed project area is located in lowlands associated with a drainage directly north of Gobernador Canyon. Frances Mesa overlooks the location from the north and east. The proposed project area is within a mature pinon-juniper habitat, though the majority of the proposed project area falls within existing disturbance associated with an existing well pad (the San Juan 29-7 Unit Nos. 82A, active and 157, plugged and abandoned).

The proposed project would be directionally drilled. The bottom hole and surface locations for Alternative B would be as follows:

Table 1: Le2al Location ofProposed Achon Area

Mapped Location	Footages	Section	Township	Range	County	State
Bottom Hole	1920' FSL[1] & 500' FEL[2]	04	29 North	07 West	Rio Arriba	New Mexico
Surface (Well Pad	775' FSL & 1535' FEL					

New Mextco Prmctpal Meridian (NMPM)

[1]FSL =From the South Line

[2]FEL = From the East Line

Figure 1: Vicinity Map
Burlington Resources Oil and Gas Company LP
Proposed San Juan 29-7 Unit #82M T29N,
R07W, Section 04, NMPM
Rio Arriba County, New Mexico

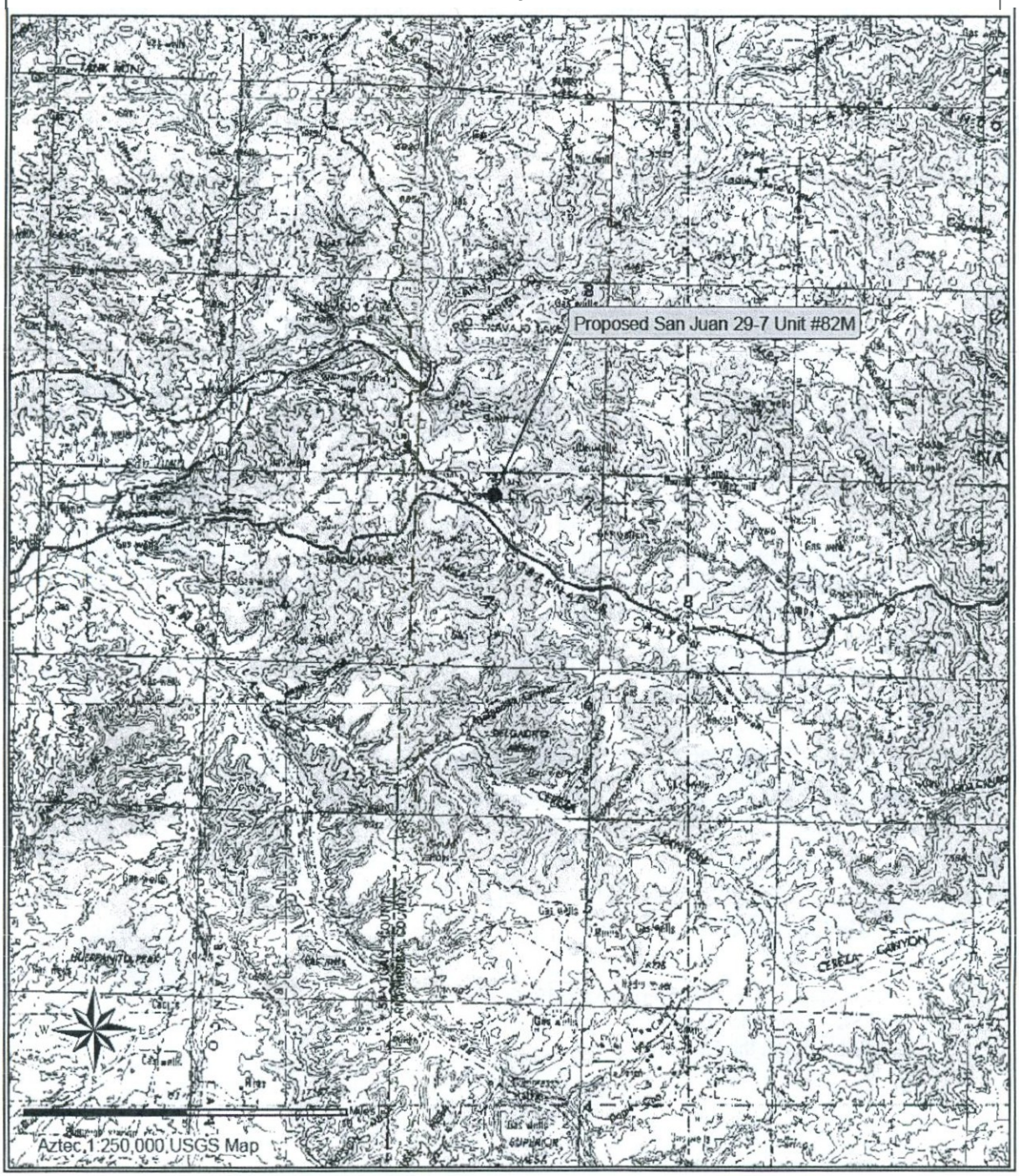
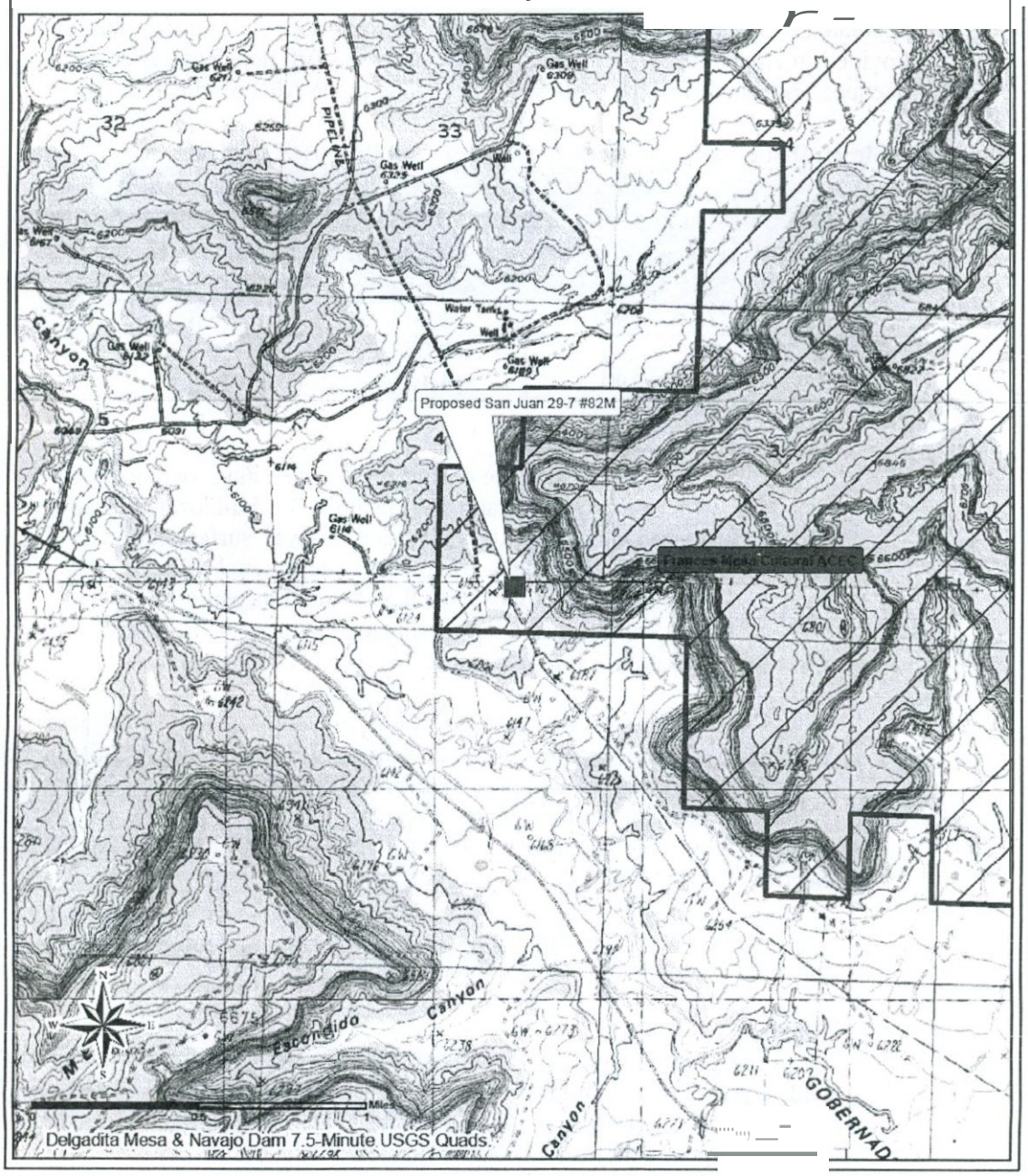


Figure 2: Project Area Map Burlington Resources Oil & Gas Company LP Proposed San Juan 29-7 Unit No. 82M
T29N, R07W, Section 04, NMPM
Rio Arriba County, New Mexico



2.2.2 Proposed Action Phases

Construction Phase

The maximum disturbance associated with the proposed action would be approximately 3.15 acres (including well pad, construction zone, and pipeline tie) under the assumption of a 40-foot wide pipeline right-of-way (ROW) grant. Actual new disturbance that would be created by the proposed project would be approximately 1.10 acres. Survey plats are provided in Appendix B. For a detailed description of design features and construction practices associated with the proposed action, refer to the APD on file at the BLM-FFO.

Table 2: Disturbance Acreage Associated with Proposed Project

Project Component	Previous/ Existing Disturbance Acreage	New Disturbance Acreage	Restricted Acreage – No Disturbance (Archaeology)	Totals
Well Pad	1.93	1.04	0.06	**3.03**
Pipeline Tie	0.06	0.06	0	**0.12**
Totals	**1.99**	**1.10**	**0.06**	**3.15**

Well Pad

Alternative B would include the expansion of an existing, twinned well pad (the San Juan 29-7 Unit Nos. 82A and 157) using a D-8 bulldozer. Clearing for the well pad is needed to provide space and a level surface for a drilling rig, completion rig, and other heavy equipment to access and drill the well. The San Juan 29-7 Unit No. 82M proposed well pad would measure 230 feet by 300 feet with a 50-foot construction zone perimeter, for a total of approximately 3.03 acres (see Appendix E for the proposed well pad survey plat).

However, actual new disturbance would be approximately 1.04 acres. The proposed well pad would overlap an existing well pad and two existing access roads (approximately 1.93 acres total previous disturbance). The construction zone would be limited east of the proposed well pad due to the presence of an archaeological site (approximately 0.06 acre of restricted area, see details in Sections 3.5 and 4.5, Cultural Resources).

The maximum area of fill would be 9.0 feet on the southwestern corner; the maximum cut would be 9.8 feet on the southeastern corner.

Pipeline Tie

Once the proposed well is completed, an associated 130.92-foot-long, 40-foot-wide pipeline route would be constructed, connecting the proposed San Juan 29-7 Unit No. 82M well to an existing pipeline. The maximum disturbance resulting from the pipeline tie would be approximately 0.12 acre.

However, actual new disturbance resulting from the pipeline tie would be approximately 0.06 acre. The proposed pipeline route would cross an existing, 20-foot-wide access road (approximately 0.02 acre of previous disturbance). It would also parallel one existing access road for 78.86 feet (approximately 0.04 acre of previous disturbance). When constructed parallel to an access road, a pipeline ROW requires only 20 feet of new disturbance width.

Recommended mitigation measures would be implemented as Conditions of Approval (COAs) to the APD; additional mitigation may be listed in the SOA. Below are site-specific construction mitigation measures determined for the proposed action, per the October 9, 2007 and July 14, 2011 onsite meetings:

GENERAL CONSTRUCTION:

- Excavated materials from cuts would be used on fill portions of the location.
- The boulders present between Comers No.4 and 6 would not be moved.
- Trees six inches or greater in diameter (at breast height) would be cut, delimbed, and stacked. Smaller trees and sagebrush would be mulched into the topsoil.
- The top six inches of topsoil would be stockpiled in the construction zone; this topsoil would be utilized during reclamation.
- Drainages, culverts, silt traps, and other applicable BMPs would be installed as necessary during interim reclamation for proper drainage and sedimentation management. Specifically:
- An existing diversion would be re-established below the cut and around the well pad.
- Culvert(s) would be installed at the pad entrance, if needed.
- The existing well pad to the north would be used as a temporary use area.
- The well pad construction zone would be limited due to the presence of cultural resources.
- Noise stipulations would be enforced.
- Above-ground structUres would be low in profile and painted to blend with the natural color of the landscape (Juniper Green Federal Standard 595a-17127).

PITS:

- The reserve pit would be lined with an impervious material, at least 12 millimeters thick.
- All pits would meet State of New Mexico, Oil Conservation Division (NMOCD) pit guidelines and rules, NMAC 19.15.17.
- Upon final reclamation of the reserve and blow pits, pits would be filled utilizing existing disturbance only.
- Cut material from the reserve and bum pits would be stockpiled on the location or used to construct back-walls of the bum pit.
- A tight sheep fence would be constructed around three sides of the pit during drilling and completion, and around the fourth side after the completion rig leaves the wellhead. The fences would remain until the pits are dried and backfilled.

Drilling Phase

After the well pad is constructed, a drilling rig would be moved onto the location and assembled. Drilling to the formations would require approximately 14 days. After the well has been drilled, completion would take approximately 14 additional days. Construction, drilling, and completion are expected to require four to eight weeks total. During this phase, both heavy equipment and light vehicles would use existing BLM roads to access the well site. Traffic would include drilling rigs, large tractor-trailers, construction equipment, water trucks, drilling and production equipment, tanks, and numerous light pick-ups.

Production Phase

Interim Reclamation

After the well is completed, interim reclamation would occur. During interim reclamation, all new disturbance areas would be reclaimed. The following would occur during interim reclamation:

- Slopes would be re-contoured to pre-construction topographical contours.
- Disturbed areas would be seeded with a BLM-FFO-designated seed mix.

Equipment Onsite

Production equipment may be required to conform to BLM-FFO Noise Notice to Lessees (NTL) standards. The well production equipment that would remain onsite would include the following:

- Dual wellhead
- Production unit separator
- Cathodic station with solar panel
- Meter run with electronic telemetry
- One to two 500-barrel storage tanks
- Possibly a compressor, to assist in bringing fluids and gas to the surface. The compressor size would be dependent upon production.

Activities

After production of the well begins, normal upkeep would be required. Typically, one pick-up truck would come to the well site approximately every two days during the normal work week to check on production and resolve any problems that may occur at the well. Trucks would be used to remove wastewater stored in tanks on the site. The frequency of water hauling would depend on the amount of water the well produces and may vary from once a day to once a month. Occasionally, a work-over rig would be required for downhole maintenance. Surface impacts of a work-over rig would be similar to the effects described for drilling, although usually to a lesser degree. The estimated production phase of a well is 20 to 30 years.

Abandonment Phase

When the well is no longer commercially viable, it would be plugged and abandoned as follows:

- Downhole well abandonment would be canied out under current BLM-FFO regulations for well plugging and surface restoration.
- Surface equipment would be removed, except for an aboveground marker that would contain individual well identification information, including the location of the plugged hole.
- The proposed well pad, if not needed for other purposes, would be reclaimed as specified in the approved COAs. Typically, slopes would be re-contoured to pre-construction topographical contours. Disturbed areas would be seeded with a BLM-FFO-designated seed mixture.
- The underground pipeline tie would typically be plugged and left in place.

2..3 Alternatives Considered but not Analyzed in Detail

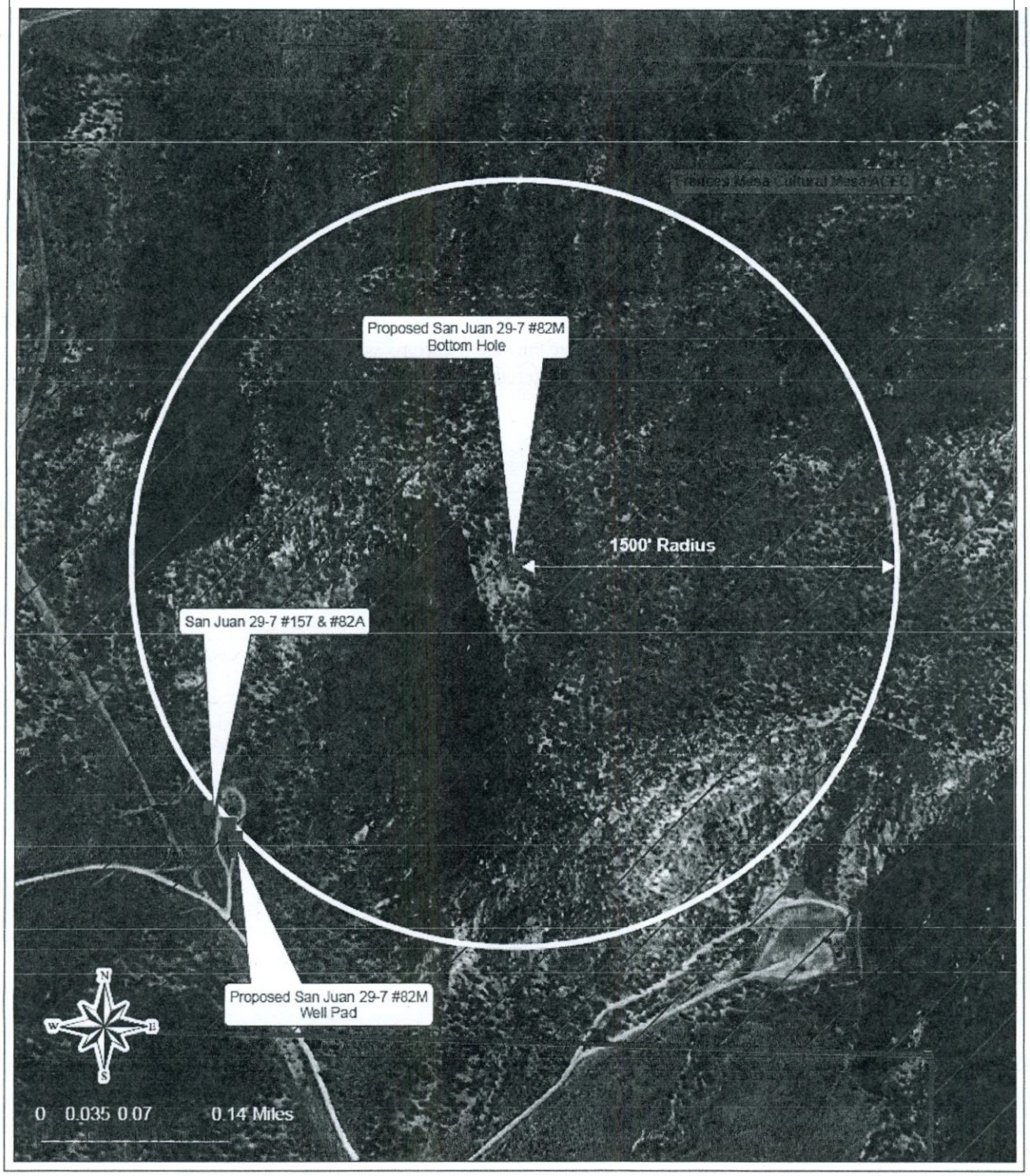
Alternatives to the proposed action were considered, particularly because the proposed well is within Frances Mesa ACEC. Within a 1500-foot, technically feasible radius of the proposed bottom hole location, it is possible to locate the well pad outside of the ACEC. However, locating the well pad outside of the ACEC would require placing the well pad on fee surface within the extreme northwestern reach of a directional drill (see Figure 3, page 11). The owner of the fee surface requested that the pad not be located on his land.

Other than the proposed project location, no other existing well pads are located within a 1500-foot reach of the proposed bottom hole. The proposed project, twinning on the San Juan 29-7 Unit Nos. 82A (active) and 157 (plugged and abandoned) well pad, was chosen as Alternative B for the following reasons:

- The well pad would utilize existing disturbance for all long-term surface activities.
- No new access road would be required.
- Minimal disturbance (0.06 acre), would be required for the pipeline tie; most pipeline tie disturbance would parallel existing road disturbance.

No other economically feasible alternative surface locations were identified that would create less disturbance and more suitably reach the targeted formations and drilling window.

Figure 3: Alternate Location Map Burlington Resources Oil & Gas Company LP Proposed San Juan 29-7 Unit No. 82M
T29N, R07W, Section 04, NMPM
Rio Arriba County, New Mexico



3.0 .11escription of Affected Environment

Chapter 3 describes the environment that may be affected by implementation of the proposed action and any lternatives described in Section 2. If they are present, critical resource elements require analysis under BLM policy. These elements are listed below in the below table. Following the table only those

CRITICAL RESOURCE ELEMENTS			
Air Resources	Construction activities and well production facilities are potential emission sources.	YES	3.1, 4.1
Surface and Groundwater Quality and Quantity	Construction activities may result in sedimentation, which could affect water quality downgradient of the proposed action area.	YES	3.2, 4.2
llazardous and Solid Wastes	Some oil and gas constituent wastes could be subject to regulations as hazardous substances under CERCLA.	YES	3.3, 4.3
Environmental Justice/Socio-Economics	The regional population includes minority and low-income groups.	YES	3.4, 4.4
Cultural Resources	A project-specific cultural resources inventory is required for all ground-disturbing activity.	YES	3.5, 4.5
Native American Religious Concerns	Native American Religious Concerns have been evaluated on a regional and local scale within the BLM-FFO management area. These concerns may be analyzed in detail on a site-specific basis.	YES	3.6, 4.6
Federally Listed Species	Federally Listed Species habitat is present within BLM-FFO boundaries and evaluated on a project-specific basis.	YES	3.7, 4.7
Invasive, Non-native Species	The potential for introduction of invasive, non-native species exists through ground disturbance, as well as through transportation of equipment and facilities.	YES	3.8, 4.8
Areas of Critical Environmental Concern (ACEC)	The proposed action area is within Frances Mesa Cultural ACEC.	YES	3.9, 4.9
Wilderness	The proposed action area is not in or near a designated Wilderness Area.	NO	
Wild and Scenic Rivers	No Congressionally-designated or potentially eligible Wild and Scenic Rivers exist within BLM-FFO boundaries; such areas would not be affected by the proposed action.	NO	
Floodplains	According to FEMA maps, no floodplains (as defined by Executive Order No. 11988) are present in the proposed action area.	NO	
Farmlands, Prime and Unique	A field visit to the location ensured that no farmlands (as defined by 30 U.S.C. 1201 et seq. and 7 U.S.C. 4202 et. seq.) are present in the proposed action area.	NO	
Wetlands/ Riparian Zones	A search of records and a field visit to the site ensured that no surface water resources, seeps, or springs are present within the proposed action area.	NO	
NON-CRITICAL RESOURCE ELEMENTS			
Mineral Resources/ Geology	The proposed action is intended to extract local mineral resources.	YES	3.10, 4.10
Soils	The proposed action includes the disturbance, mixing, and compaction of local soils.	YES	3.11, 4.11

RESOURCE	POTENTIAL TO OCCUR IN THE PROPOSED ACTION AREA OR TO BE AFFECTED BY THE PROPOSED ACTION	FURTHER ANALYSIS ?	SECTIONS
Watershed/ Hydrology	Alterations to soils and vegetation may result in sedimentation downgradient of the proposed action area, consequently affecting local hydrology.	YES	3.12, 4.12
Vegetation/ Forestry	Construction would include the removal of some local vegetation, ultimately changing the species composition.	YES	3.13, 4.13
Wildlife	The proposed action may disturb wildlife species and change habitat composition.	YES	3.14, 4.14
Migratory Birds	The proposed action may disturb migratory bird species and change habitat composition.	YES	3.15, 4.15
Range	The proposed action area is within a BLM-FFO grazing allotment.	YES	3.16, 4.16
Special Management Species (SMS)	SMS habitat is present within BLM-FFO boundaries and is evaluated on a project-specific basis.	YES	3.17, 4.17
Wild Horses and Burros	Neither wild horses nor burros are present in the proposed action area; these animals would not be affected by the proposed action.	NO	
Recreation	All BLM-FFO lands are managed for recreation.	YES	3.18, 4.18
Visual Resources	The proposed action would result in visual scarring and a change in local topography. Production facilities may result in a long-term change in the landscape view.	YES	3.19, 4.19
Noise	Construction, drilling, and production activities and facilities may result in a change in area noise.	YES	3.20, 4,20
• Paleontology	BLM-FFO lands are designated as Very High Potential paleontological resource areas, thus requiring an assessment at the project level.	YES	3.21,4.21

3.1 Air Resources

The proposed action area is in Rio Arriba County, New Mexico. Additional general information on air quality in the area is contained in Chapter 3 of the BLM-FFO RMP/EIS. In addition, new information about greenhouse gases (GHGs), and their effects on national and global climate conditions has emerged since this RMP was prepared. Ongoing scientific research has identified the potential impacts of GHG emissions (such as carbon dioxide [CO_2], methane [C], 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. These changes are typically referred to as global warming.

The 2003 RMP 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 Environmental Protection Agency (EPA) announced a new primary eight-hour standard of 0.075 parts per million (ppm). In addition, on October 17, 2006, the EPA issued a final ruling on the lowering of the NAAQS for particulate matter measuring 2.5 microns (PM2.5) or smaller. This ruling became effective on December 18, 2006. It stated that the 24-hour standard for PM2.5 was lowered to 35 micrograms per cubic meter (ug/m^3) from the previous standard of 65 ug/m^3. This revised NAAQS was promulgated to better protect the public from short-term particle exposure.

Increased development in the Four Comers 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 be seen in the skies, impacting visibility, and there are concerns for the ecosystem due to the deposition of mercury and nitrogen.

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 ELM-authorized activities on air resources as part of the planning and decision making process.

The EPA has the primary responsibility for regulating air quality, including the regulation of seven nationally regulated ambient air pollutants. Regulation of air quality is also delegated to some states, including New Mexico. Air quality is determined by atmospheric pollutants and chemistry, dispersion meteorology, and terrain. Air quality 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 EPA; however, climate has the potential to influence renewable and non-renewable resource management.

Air Quality

The proposed action area is within 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 action area is generally good. The proposed action area is not within an EPA-designated "non-attainment area" 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-hour ozone values in the region will be declining in the future. At the present time, San Juan County is classified as in attainment with the revised federal ozone standard of 0.075 ppm. Rio Arriba County is unclassified because of there are no ozone monitors sited in Rio Arriba County.

Greenhouse gases, including CO_2 and CH_4, and the potential effects of GHG emissions on climate, are not regulated by the EPA under the Clean Air Act. However, climate has the potential to influence renewable and non-renewable resource management. The EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks found that in 2007, total U.S. GHG emissions were over 7 billion metric tons and total U.S. GHG emissions increased by 17 percent between 1990 and 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: (1) 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 (EPA 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 results in behavioral and industrial adaptations.

Climate

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. Global mean surface temperatures have increased nearly 1.0° C (1.8° F) from 1890 to 2006 (Goddard Institute for Space Studies, 2007). In 2007, the Intergovernmental Panel on Climate Change (IPCC) 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. Observations and predictive models indicate that average temperature changes are likely to be greater in the Northern Hemisphere.

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: 1) 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 mean annual temperatures have exceeded the global averages by nearly 50 percent since the 1970s (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.

3.2 Surface and Groundwater Quality and Quantity

The proposed action area is in the Colorado River Drainage Basin, in which the Animas and San Juan Rivers are the largest perennially flowing streams. No surface waters are located within the vicinity of the proposed action area. Most stream and wash channels in the region are ephemeral. In the region, natural soil erosion compounded by man-made barren surfaces and historic livestock grazing has led to high sedimentation of drainages. The quantity of surface water can reach flash-flood levels during thunderstorms or rapid snowmelts. Runoff and sedimentation in washes during precipitation events can be considerable. Generally, surface water quality in

- drainages is extremely poor following storm/flood/rapid snowmelt events. Key features that adversely influence the surface water quality include ephemeral water sources, sparse vegetative cover, highly erosive and saline soils, and rapid runoff. Erosion conditions promote the formation of canyons, arroyos, and gullies, further contributing to poor water quality.

The BLM-FFO has estimated that surface runoff frequently contains more than 10,000 milligrams per liter (mg!L) of suspended sediment and more than 1,000 mg!L of total dissolved solids (TDS). Public Law 93-320 mandated control of salinity runoff into the Colorado River Basin. A 1984 amendment to the Colorado River Salinity Control Act of 1974 "...specifically requires the Director of the BLM to develop a comprehensive program for minimizing salt contributions to the Colorado River and their tributaries from BLM administered lands" (BLM 1988). No specific, quantifiable water quality or quantity data for the proposed action area is available.

Colorado Plateau aquifers underlie an area of approximately 110,000 square miles in western Colorado, northwestern New Mexico, northeastern Arizona, and eastern Utah. The distribution of these aquifers is controlled largely by structural deformation, and the principle aquifers interconnect across the plateau and are present within basins located on the plateau, such as the San Juan, Uinta, and Piceance Basins.

The Uinta-Animas aquifer is widespread across the Colorado Plateau and present in the Uinta, Piceance, and San Juan Basins. Sedimentary rocks in this aquifer are Lower Tertiary in age. The Uinta-Animas aquifer in the San Juan Basin of northwestern New Mexico consists of the San Jose Formation; the underlying Animas Formation in the Durango area and its equivalent in northern New Mexico, the Nacimiento Formation; and the Ojo Alamo Sandstone. The Animas Formation in Durango consists of a main body of green volcaniclastic conglomerate, sandstone and shale, and the basal McDermott Member, also a volcaniclastic conglomerate. The Nacimiento Formation and Ojo Alamo Sandstone are primarily permeable conglomerates and sandstones interbedded with less permeable shale and mudstone. The thickness of the aquifer in the northeastern San Juan Basin is approximately 3500 feet. Aquifers beneath the Uinta-Animas aquifer are the Mesa Verde aquifer, the Dakota-Glen Canyon aquifer, and the Coconino-DeChelly aquifer.

Recharge of the Uinta-Animas aquifer in the San Juan Basin occurs at the higher altitude areas that encircle the Basin. Most water supplies in the Basin are obtained from valley fill deposits of Quaternary age along rivers, and some of the shallower Cretaceous sandstones bodies. Terrace deposits of boulders and cobbles cut into Tertiary bedrock. Thickness of terrace deposits generally does not exceed 30 feet. Alluvial valley fill deposits of sand, gravel, silt, and clay rarely exceed 100 feet in thickness. Limited surficial and groundwater resources are available due to the arid climate. Irrigation water for agriculture comes from the diversion of the perennial streams and rivers. Outside of the river corridors, dry farming is nearly nonexistent.

3.3 Hazardous or Solid Waste Materials

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 U.S. Environmental Protection Agency (EPA) regulations define solid wastes as any "discarded materials" subject to a number of exclusions. A "hazardous waste" is a solid waste that is (1) listed by the EPA as a hazardous waste, (2) exhibits any of the characteristics of hazardous wastes (ignitability, corrosivity, 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, the EPA 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 (I) 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 the EPA.

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 Conservation Division (OCD) administers hazardous waste regulations for oil and gas activities in New Mexico.

There are no known hazardous or solid waste materials currently present within the proposed action area.

3.4 Environmental Justice/Socio-Economics

On February 11, 1994, the President issued Executive Order No. 12898 concerning Environmental Justice and impacts on minority and low-income populations. The purpose of this order is to identify and address disproportionately high or adverse human health and environmental effects from programs, policies, or activities on minority or low-income populations.

In the region around the proposed action area, statistically significant populations include Native Americans, Hispanics, and white Euro-Americans. Some members of these populations are within fmancially low-income groups. Rio Arriba County has produced oil arid gas resources for over 40 years. The extraction of this resource is an income source to the local communities as well as to the County, the State of New Mexico, and the Federal government. Many County and local contractors and their employees are employed in some aspect of the oil and gas industry.

3.5 Cultural Resources

The proposed project area is located within the archeologically rich San Juan Basin. The pre-history ofthe San Juan Basin can be divided into five major periods:

- Paleolndian (cs. 10,000 B.C. to 5,500 B.C.)
- Archaic (ca. 5,500 B.C. to A.D. 400)
- Basketmaker II-III and Pueblo I-IV periods (A.D. 1 to 1540)
- The historic (A.D. 1540 to present) - includes Native American as well as later Hispanic and Euro-American settlers.

Detailed description of these various periods and select phases within each period is provided in the Bureau of Land Management Farmington Field Office Final Environmental Impact Statement and Resource Management Plan (2003) and will not be reiterated here. Additional information is also included in an associated documented, Cultural Resources Technical Report (CRTR; SAIC 2002).

The BLM-FFO has categorized variability in archeological sites by major time period, cultural affiliations/components, average size, and occurrence of features in each of the 20 watersheds within the BLM-FFO's jurisdiction (BLM 2003b:3-88). The proposed project area is within the Gobemador watershed. Based on the PRMP/FEIS, a total of 1163 sites, representing 1608 temporaVcultural components, have been documented within the watershed (BLM 2003b). Of the 19 categories of sites defmed based on temporaVcultural affiliation (Table 3-18 of the PRMP/FEIS; page 3-89), 16 are represented in the watershed. Lacking in the watershed are sites attributed to

Apache and Pueblo occupations. The most frequently occurring sites with identifiable cultural affiliations recorded are Navajo Reservation period components or prehistoric Anasazi Pueblo I period components (BLM 2003b:3-9).). Features common to these sites include simple artifact scatters, pithouses, small pueblos, hogans, sweat lodges, and rock art.

Cultural resource inventories conducted on Frances Mesa and the surrounding areas within the ACEC have revealed extensive Navajo and Anasazi settlements with Navajo components outnumbering Anasazi sites nearly three to one. This ratio is the opposite of the entire watershed as a whole. In some areas, particularly the mesa top, the site density is over 160 sites per square mile. There is also historic 20th and 21st century Anglo/Hispanic use of lands within the ACEC and surrounding areas. As of March, 2009, there were 602 archaeological sites representing 713 components on record in the ACEC and approximately 4,000 acres of the ACEC have been inventoried for cultural resources. The figures are most likely slightly higher because not all known surveys have been electronically captured in a GIS environment.
A BLM Class I literature review was conducted by Aztec Archaeological Consultants, LLC (AAC) prior to the cultural resources inventory (Report No. 2007-084). AAC determined that two previously recorded archaeological sites are located within 0.25 mile of the proposed project area. These sites do not fall within the boundaries of the proposed project area or its cultural buffer zone.

The entire area of potential affect was surveyed at a BLM Class III level (100 percent) by AAC. Report No. 2007-084 was prepared and submitted to the BLM-FFO in accordance with the *Procedures for Performing Cultural Resources Fieldwork on Public Lands in the Area of New Mexico BLM Responsibilities* (BLM 2005). The BLM concurred with the report's fmdings in Report No. 2008(fV)055F. One new archaeological site was discovered (LA 157548) in the proposed construction zone and cultural buffer zone southeast of Comer No. 5. The site is interpreted as a Navajo Dim!tah/Gobernador phase temporary habitation, possibly associated with seasonal use of the area. LA 157548 appears to represent a significant cultural resource and is recommended as eligible for inclusion in the National Register of Historic Places (NRHP). The location and site were field checked by BLM cultural staff on July 29, 2007.

3.6 Native American Religious Concerns

"Traditional Cultural Properties (TCPs)" is a term that has emerged in historic preservation management and the consideration of Native American religious concerns. TCPs are places that have cultural values that transcend, for instance, the values of scientific importance that are normally ascribed to cultural resources such as archaeological sites. The National Park Service (Parker and King 1998:I) 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).

Native American cultural assoctatwns are the "communities" most likely to identii)r TCPs, although TCPs are not restricted to this group. Some TCPs are well known, while others may only be known to a small group of traditional practitioners, or otherwise only vaguely known.

There are several pieces of legislation or Executive Orders that should be considered when evaluating Native American religious concerns. These govern access and use of scared sites, possession of sacred items, protection and treatment of human remains, and the protection of

archaeological resources ascribed with religious or historic importance. These include the following:

- The American Indian Religious Freedom Act of 1978 (AIRFA; 42 USC 1996, P.L. 95-431 Stat. 469):
  - Possession of sacred items
  - Performance of ceremonies
  - Access to sites
- Executive Order 13007 (24 May 1996):
  - Access and use of sacred sites
  - Integrity of sacred sites
- The Native American Graves Protection and Repatriation Act of 1990 (NAGPRA; 25 USC 3001, P.L. 101-601):

  Protection, ownership, and disposition of:
  - Human remains
  - Associated funerary objects
  - Unassociated funerary objects
  - Sacred objects
  - Objects of cultural patrimony
- The Archaeological Resources Protection Act of 1979 (ARPA; 16 USC 470, Public Law 96-95):

  Protection of archaeological resources on Federal and Indian lands

For the proposed action, identification of TCPs was limited to reviewing existing published and unpublished literature (Val Valkenburgh 1941, 1974; Brugge 1993), and the site-specific cultural resources survey report conducted for the proposed action. In addition, the BLM's cultural resources program was contacted for information regarding the presence of TCPs identified through ongoing BLM tribal consultation efforts.

Frances Mesa has been identified as a Navajo-affi liated TCP (Kelly at al 2006). The Navajo names *Naadaa' Dzii*, or *Nahat'A Dziil* mean "Com Stronghold" or "Planning Stronghold." Frances Ruin, located on the Mesa, is reportedly at the center of Dinetah, or ancestral Navajo lands. Frances Mesa is also a place where Holy people were thought to have held a ceremony that created Navajo, Jicarilla, Mescalero, and San Carlos Apache peoples, as well as game animals (including deer and elk).

3.7 Federally Listed Threatened or Endangered Species

According to the USFWS, there are five federally listed Threatened or Endangered species (TES) and seven Candidate listed species with potential to occur in Rio Arriba County, New Mexico. The below table lists these species along with their status, habitat, and potential to occur within the proposed action area.

Table 4: USFWS-listed Threatened, Endangered, and Candidate Species with Potential to Occur in Rio Arriba County, New Mexico

Species	Federal Status	Habitat	Potential to Occur in Proposed Action Area (PAA)
		FISH	
Rio Grande cutthroat trout (*Oncorhynchus clarki virginalis*)	Candidate	Small streams and lakes at high elevations (7,500-10,750 feet)	DOES NOT OCCUR: No water resources within the immediate vicinity ofPAA.
Rio Grande silvery minnow (*Hybognathus amarus*)	Endangered	Streams with slow to moderate current over silty or sandy substrate; depth of stream typically less than 50cm Current known distribution: perennial sections of Rio Grande and associated canals	DOES NOT OCCUR: No water resources within the immediate vicinity ofPAA.
Roundtail chub (*Gila robusta*)	Candidate	Rocky runs, rapids, and pools of creeks and small to large rivers.	DOES NOT OCCUR: No water resources within the immediate vicinity ofPAA.
		BIRDS	
Interior least tern (*Sterna antillarum*)	Endangered	Lakes and rivers with sandy beaches and mudflats; Nesting: riverine sandbars or salt flats Winters: out of region	DOES NOT OCCUR: No lake or river margins within immediate vicinity of PAA.
Mexican spotted owl (*Strix occidentalis lucida*)	Threatened with Critical Habitat	Old growth or mature forests with complex structural components (uneven aged stands, high canopy closure, multi-storied levels, high tree density), preferring canyons with riparian or conifer habitats Nesting: trees, cliff ledges, or caves	DOES NOT OCCUR: No structurally complex forests or riparian/conifer canyons within immediate vicinity of PAA.
Southwestern willow flycatcher (*Empidonax trail/ii extimus*)	Endangered with Critical Habitat	Breeding: Dense, riparian habitats Winters: out of region	DOES NOT OCCUR: No riparian areas within immediate vicinity of PAA.
Yellow-billed cuckoo (*Coccyzus americanus*)	Candidate	Breeding: tall cottonwood, mature willow riparian, or deciduous woodlands; moist thickets; orchards; or overgrown pastures Winters: out of region	DOES NOT OCCUR: No cottonwood, riparian, or deciduous woodlands; moist thickets; orchards; or overgrown pastures within immediate vicinity of the PAA.
		MAMMALS	
Black-footed ferret (*Mustela*	Endangered	Grasslands, steppe, and shrub steppe; closely associated with prairie dog	DOES NOT OCCUR: No recorded prairie dog colonies or prairie dog burrows within immediate vicinity of

Species	Federal Status	Habitat	Potential to Occur in Proposed Action Area (PAA)
nigripes)		colonies (preferably colonies larger than 80 hectares)	PAA.
Canada lynx *(Lynx canadensis)*	Candidate	Boreal and montane regions dominated by coniferous or mixed forest with thick undergrowth. May also enter open forest, rocky areas, and trundra to forage for prey.	DOES NOT OCCUR: No boreal or montane regions within PAA.
Gunnison's prairie dog *(Cynomys gunnisoni)*	Candidate	High mountain valleys and plateaus within open or slightly brushy country with scattered junipers and pines. Elevation 6000-12,000 ft.	DOES NOT OCCUR: Habitat within PAA is not open or slightly brushy. No recorded prairie dog colonies in immediate vicinjty of PAA.
New Mexican meadow jumping mouse *(Zapus hudsonius luteus)*	Candidate	Sedge-forb-willow zones along permanent streams, large wet meadows within river floodplains, n¥fOW riparian zones along irrigation ditches.	DOES NOT OCCUR: No riparian habitat occurs within immediate vicinity ofPAA.
		AMPIDBIANS	
Jemez Mountains salamander *(Plethodon neomexicanus)*	Candidate	Mixed conifer habitat with abundant rotted logs and surface rocks; vegetation is dominated by Douglas-fir, spruce, ponderosa pine, white ftr, with occasional aspen.	DOES NOT OCCUR: No mixed conifer forest habitat within immediate vicinity ofPAA.

Based on habitat and range, the potential does not exist for any Federally listed species to occur within the proposed action area.

3.8 Invasive, Non-Native Species

Management of invasive and non-native species is mandated under the Lacey Act, as amended; the Federal Noxious Weed Act of 1974, as amended; and Executive Order 13112, Invasive Species (February 3, 1999). Invasive plants are found in the San Juan Basin, particularly in areas disturbed by surface activities. These plants displace native plant communities and degrade wildlife habitat. A total of 212 invasive and poisonous weeds have been identified on public land administered by the BLM-FFO (Heil and White 2000).

No Federally listed noxious or invasive weed species were observed within the proposed action area. Cheatgrass *(Bromus tectorum)*, a New Mexico-listed Class C noxious weed, is present. Class C species are widespread in the state. Management decisions for these species are determined at the local level, based upon feasibility of control and level of infestation. Russian thistle *(Sa/sola iberica)* is also present within the proposed action area. Though not federally or state-listed, this species is known to outcompete native species throughout the Four Corners.

3:9 Areas of Critical Environmental Concern (ACECs)

The proposed action area is within Frances Mesa Cultural ACEC. There are a total of7657 acres within the boundary of this ACEC, of which 590 I acres are BLM-FFO land 5901 acres contain federal minerals. Frances Mesa ACEC includes the formerly designated Frances Ruin ACEC and the Romine Canyon Special Management Area (SMA). Numerous !8th-century Navajo pueblitos, including Frances Canyon Ruin, are located within the ACEC. Frances Canyon Ruin, one of the largest known Navajo defensive sites, has 40 rooms, a plaza, and a three-story tower. It was excavated in 1915 by Earl Morris, a leading archaeologist in early Southwest archaeological research. Frances Canyon Ruin has also been identified as a location important in Navajo origin stories. Frances Canyon Ruin was listed on the National Register of Historic Places in 1972. Romine Canyon, an additional defensive site within the ACEC, was listed on the National Register in 1987. Both sites are also listed on the New Mexico State Register of Cultural Properties.

Previous cultural resource studies and surveys in the ACEC have been generally limited to inspections ahead of oil- and gas-related activities, such as well pads and pipelines. Cultural resource inventories conducted on Frances Mesa and the surrounding areas withirr the ACEC have revealed extensive Navajo and Anasazi settlements. In some areas, the site density is over 60 sites per square mile. There is also historic 20th- and 21[51]-century Anglo/Hispanic use of the mesa and surrounding areas. According to available GIS data from the Laboratory of Anthropology Archaeological Records Management Section (ARMS), as of March 2009 there were 602 archaeological sites on record in the ACEC and almost 4000 acres of the ACEC had been inventoried for cultural resources. Actual numbers are most likely slightly higher because not all surveys have been electronically captured in a GIS environment.

The management goal of Frances Mesa ACEC .is the protection and preservation of cultural values (BLM 2003). The RMP contains a complete description of the management prescriptions for the ACEC. The following management prescriptions apply to the proposed action:

- Existing oil and gas leases will be managed under a No Surface Occupancy constraint for Frances Ruin and Romine Canyon. Elsewhere within the ACEC, existing oil and gas leases will be managed under a Controlled Surface Use constraint.
- No new ROWs will be allowed in Frances Ruin and Romine Canyon. Elsewhere within the ACEC, new ROWs must be placed in existing ROW/easement disturbance for additional acreage. The BLM-FFO will coordinate with ROW/easement holders regarding maintenance and use of existing ROWs/easements.
- The former Frances Ruin ACEC will be designated as a VRM Class II area. The remainder of the ACEC will be designated as VRM Class III.
- Other surface-disturbing activities, ·other than ROWs previously listed, will be restricted to minimie disturbance and impacts.
- Class III and ethnographic inventories will be conducted.
- Noise receptor points will be designated at Frances Ruin defined sites. No other noise receptor points will be designated within the ACEC.

3.10 Mineral Resources/Geology

The San Juan Basin holds the second largest accumulation of natural gas in the country in Upper Cretaceous sandstone reservoirs of the Pictured Cliff, Mesa Verde Group, Gallup, and Dakota sandstone. These Cretaceous formations, deposited in marine environments in the Western Interior Seaway, are conventional sources of natural gas, and range in depth from 2500 to 8000 feet throughout the Basin. Most wells permitted in the New Mexico portion of the Basin are conventional. New Mexico alone provides approximately 95% of the San Juan Basin production.

Coalbed methane is a more recent development of an unconventional source of natural gas, in that the natural gas is methane associated with coalbeds found in the Upper Cretaceous Fruitland Formation. The Fruitland and overlying Kirtland Formations both contain coalbeds that are mined for coal-fired power plants. Coalbed methane wells tend to be shallower, especially along the northeastern edge of the Basin, and thus extract large amounts of produced water during production. Coal seam sources contribute more than 60% of the basin total output, with New Mexico accounting for approximately 53 percent of the volume.

Surface geology ofthe proposed project area is of the Tertiary San Jose Formation. The San Jose is the uppermost formation in the Basin proper, consists of a sequence of interbedded sandstones and mudstones, and generally forms cliffs with some slopes. It consists of several distinctive members. The Cuba Mesa Member is a 100- to 300-foot-thick, single- or multiple-sheet sandstone, which grades laterally into the Regina Member. The Regina Member consists of green, gray, purple, and yellow mudstone interbedded with lenticular sandstone. The Llaves and Tapicots Members cap the high mesas in the area. The Llaves Member consists of cliff-forming conglomerate and thickly bedded sandstones. The Tapicitos Member is characterized by brick red mudstone and light red sandstones. Separation of these two members is difficult as they are interbedded. The San Jose Formation thickness ranges from 200 feet in the west and south to 2700 feet near Cuba and Gobernador. This formation outcrops generally east of Aztec and the western part of Rio Arriba County, to near Dulce, and covers the Carson National Forest, much of the Jicarilla Apache Reservation, the Navajo Reservoir area, and along the Animas River drainage from Bondad Hill south to Aztec.

The Sa!l Jose was deposited in a sandy, braided river system with overbank floodplain deposits of mudstones and shales. Some of the variegated red and green mudstones with burrowing and root traces are indicative of paleosol development. Fossil plants and non-marine invertebrates and vertebrates suggest a humid forested environment.

3.11 Soils

The San Juan Basin is bordered by the Defiance Uplift and Chuska Mountains to the west, San Juan Dome to the north, Chaco Slope and Zuni Uplift to the south and the Nacimiento Uplift to the east. In total, the San Juan Basin covers a surface of approximately 4,600 square miles. The s ils in the San Juan Basin were formed primarily from two kinds of parent material: alluvial sediment and sedimentary rock. The 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 has a wide range of 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 Soil Conservation Service, now the Natural Resource Conservation Service (NRCS), has surveyed the soils in the proposed action area. Complete soil information is available in the Soil Survey of Rio Arriba County, New Mexico, developed by the United States Department of Agriculture, NRCS.

Soils of the proposed action area are mapped as San Mateo sandy loam. This soil type is found in valley floodplains with slopes from 0 to 3 percent. The parent material is alluvium derived from sandstone and shale. The typical profile is 3 inches of brown, sandy loam; 3 to 8 inches of pale brown, fine, sandy loam; 8 to 15 inches of pale brown, sandy loam; 15 to 46 inches of brown, clay loam; and 46 to 60 inches of pale brown, clay loam. The available water capacity is high, the permeability is moderately slow, and the soil is moderately sadie. Potential for water erosion

is slight. The major use of this soil type is livestock grazing with a potential plant community of alkali sacaton, western wheatgrass, galleta, bottlebrush squirreltail, and four-wing saltbush.

3.12 Watershed/Hydrology

The proposed project area is located in Gobernador Canyon Watershed. The proposed project area slopes toward a drainage associated with Gobernador Canyon; Gobemador Canyon is less than 0.5 mile west of the site. Gobernador Canyon drains into the Upper San Juan River approximately 7.9 miles west-northwest of the proposed action area.

The headwaters of the San Juan River are located in the San Juan Mountains of Colorado, north of Pagosa Springs. The San Juan River flow south into Navajo Reservoir in New Mexico, and then turns west and flows through northwestern New Mexico and southeastern Utah, where it empties into the Colorado River. The San Juan River is sectioned into three parts for the RMP for the BLM-FFO: upper, middle, and lower. The Upper San Juan River watershed consists of the river from Navajo Reservoir to Farmington, where it becomes the Middle San Juan River watershed. Rivers and arroyos contribute to the San Juan River primarily through spring runoff and summer flood events.

3.13 Vegetation/Forestry

The proposed action area is located within open pinon-juniper habitat. However, the majority of the proposed action area overlaps an existing well pad; therefore, most of the proposed well pad is unvegetated or consists of reseed species. Dominant flora observed within the proposed action area includes pinon *(Pinus edulis)*, one-seed juniper *(Juniperus monosperma)*, big sagebrush *(Artemisia tridentata)*, and cheatgrass *(Bromus tectorum)*. Approximately 50 trees (40 percent mature, 40 percent juvenile, 20 percent standing dead) are within the proposed action area. Immediately adjacent to the existing pad, dominant species include Russian thistle *(Salsola tragus}*, rabbitbrush *(Chrysothamnus* sp.), broom snakeweed *(Gutierrezia sarothrae)*, cheatgrass, and Indian ricegrass *(Achnatherum hymenoides)*. Ground cover within the proposed action area ranges from 30 to 100 percent.

3.14 Wildlife

The proposed action area is within New Mexico Department of Game and Fish (NMDGF) Management Unit 2B. The NMDGF monitors big game population trends in the area. Depending on winter weather conditions and snow depths, mule deer *(Odocoileus hemionus)* and elk *(Cervus elaphus)* migrate to their winter ranges from high elevations during late November and December, and migrate back to summer ranges in March or April. Twenty-five years ofNMDGF aerial survey information for Unit 2 indicates that mule deer and elk winter populations have fluctuated over the years, but no evident trend seems apparent in the proposed action area. Deer numbers counted appear to be most strongly linked with the severity of winter conditions. The data does not appear to support any cause or effect relationship between wintering deer populations and the level of oil and gas development. Elk numbers also fluctuate with severity of winter, but general trends observed over the years, combined with the professional observations ofBLM-FFO staff, indicate that elk use and resident elk populations have expanded in the BLM-FFO jurisdictional area during the past 25 years (BLM unpublished file records).

Elk scat and a whiptail *(Cnemidophorus* sp.) were recorded within the proposed action area. Several birds were also recorded (see Section 3.15, Migratory Birds). No prairie dogs or evidence of burrows or colonies were observed.

3.15 Migratory Birds

The Migratory Bird Treaty Act (MBTA) implements various treaties and conventions between the U.S. and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory

birds. Under the MBTA, taking, killing, or possessing migratory birds is unlawful. Executive Order 13186 (EO) was signed on January 10, 2001 directing executive departments and agencies of the Federal government to take certain actions to futiher implement the MBTA. Section 3 of the EO directed each Federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations to develop and implement, within two years, a Memorandum of Understanding (MOU) with the USFWS that shall promote the conservation of migratory bird populations. Section 3(c) of the EO states that the MOU shall recognize that the agency may not be able to implement some elements of the MOU until such time as the agency has successfully included the elements in that agency's formal planning process (such as revision of agency land management plans), including public participation and NEPA analysis as appropriate.

A National MOU between the BLM and the Service was signed on April 12, 2010. Included in the MOU is the stipulation that the BLM evaluate effects of projects on migratory birds. The BLM should identify where take may have a measurable negative effect on populations, focusing first on species of concern, priority habitats, and key risk factors. The BLM would then implement approaches to lessen such take.

The BLM-FFO has consulted the Partners in Flight Bird Conservation Plan for the State of New Mexico and the USFWS's list of Birds of Conservation Concern. A review of these documents, specifically as they pertain to the Colorado Plateau physiographic area, indicates there are seven "priority" avian species that utilize the piiion-juniper habitat type and seven species that utilize the Great Basin desert shrub habitat type. The selected species have a known distribution in the BLM-FFO area and may be affected by various types of perturbations. These species and a brief assessment of the effects of the proposed action on their habitat are as follows:

Table 5: Potential of Priority Migratory Birds (with a Known Distribution in the BLM-FFO Area) to Occur in Proposed Action Area

Species	Habitat	Potential to Occur in Proposed Action Area (PAA)
Ash-throated flycatcher *(Myiarchus cinerascens)*	Arid and semiarid scrub, open woodland, pifton-juniper and riparian woodlands.	POSSIBLE: Open pifion-juniper woodland found within PAA.
Bendire's thrasher *(Toxostoma bendirei)*	Brushy desert, especially areas of tall vegetation, cholla cactus, creosote bush, and yucca.	UNLIKELY: No brushy desert areas with appropriate vegetation found within PAA.
Black-throated gray warbler *(Dendroica niwescens)*	Found in pine and mixed oak-pine woodlands.	POSSIBLE: Open pifion-juniper woodland found within PAA.
Black-throated sparrow *(Amphispiza bilineata)*	Xeric desert habitats dominated by shrubs with bare, open ground.	UNLIKELY: No desert habitat with bare, open ground within PAA.
Burrowing owl *(Athem cunicularia)*	Open grasslands or desert scrub; presence o suitable nest burrow is critical prerequisite (often prairie dog burrows).	UNLIKELY: No open grasslands or desert scrub within PAA.
Cassin's kingbird *(Tyrannus voclferans)*	Found in open country with scattered trees or open woodlands, including pifion-juniper.	POSSIBLE: Open pifion-juniper woodland found within PAA.
Gray flycatcher *(Empidonax wrightii)*	Prefers open pinon-juniper forest, often with interspersed ponderosa, with an understory of shrubs.	POSSIBLE: Open pifion-juniper woodland found within PAA.
Gray vireo *(Vireo vicinior)*	Found in desert scrub, mixed juniper or pifion pine and oak scrub associations, and chaparral, in hot, arid mountains and high plains scrubland.	POSSIBLE: Open pinon-juniper woodland found within PAA.

Species	Habitat	Potential to Occur in Proposed Action Area (PAA)
Juniper titmouse *(Baeolophus ridgwayi)*	Wann, dry open woodland, especially juniper woodlands.	POSSIBLE: Open pifion-juniper woodland found within PAA.
Loggerhead shrike *(Lanius ludovicianus)*	Relatively xeric habitats dominated by shrubs and grasses.	UNLIKELY: PAA is not within xeric habitat dominated by grasses and shrubs.
Piiion jay *(Gymnorhinus cyanocephalus)*	Found in pifion-juniper woodland, sagebrush, scrub oak, and chaparral communities, and sometimes in pine forests.	POSSIBLE: Open pifion-juniper woodland found within PAA.
Sage sparrow *(Amphispiza belli)*	Sagebrush-grassland.	UNLIKELY: Sagebrush-grassland habitat not found in PAA.
Sage thrasher *(Oreoscoptes montanus)*	Sagebrush plains.	UNLIKELY: No sagebrush plains within PAA.

An ash-throated flycatcher *(Myiarchus cinerascens)*, rose-breasted grosbeak *(Pheucticus ludovicianus)*, and mountain chickadee *(Poecile gambeli)* were recorded within the proposed action area. No nests were observed.

3.16 Range

There are 167 grazing allotments managed by the BLM-FFO, with 351 grazing authorizations that permit cattle, sheep, and horse grazing within the resource area. Of the 351 grazing authorizations, 317 are permitted under section 3 of the Taylor Grazing Act. Of the 167 grazing allotments, there are four (4) authorizations issued under section 15 of the Taylor Grazing Act to the Navajo Tribe that authorizes grazing on 35 allotments. There are an additional 30 section 15 authorizations that permit grazing on 30 allotments in the Lindrith, New Mexico area.

The proposed action is located within BLM-FFO Grazing Allotment No. 5092, Navajo City, a 7697-acre allotment. This allotment, 68 percent of which is public, is currently leased to J. Fidel Candelaria. Navajo City is allotted for 70 head of cattle, year-round. A total of 571 Animal Unit Months (AUMs) are provided by the allotment. Therefore, there are 13.5 acres per AUM within the allotment. No permanent livestock water sources are within the immediate area.

3.17 Special Management Species

The BLM-FFO has prepared a list of special management species (SMS) to focus species management efforts toward maintaining habitats under a multiple use mandate, called BLM-FFO SMS. The authority for this policy and guidance is established by the Endangered Species Act of 1973, as amended; Title IT of the Sikes Act, as amended; the Federal Land Policy and Management Act (FLPMA) of 1976; and Department of Interior Manual 235.1.1A. BLM-FFO SMS with the potential to occur in Rio Arriba County, New Mexico are listed below. Those species warranting further evaluation can be found following the table.

Table 6: BLM SMS

Species	Habitat	Potential to Occur in Proposed Action Area (PAA)
Aztec gilia *(A/icie/la formosa)*	Sandy-clay hills of the Nacimiento formation, desert scrub habitat, elevation 5000-6400 ft.	UNLIKELY: PAA is not located within ELM-designated potential "zone" for this species, geology is not Nacimiento, and habitat is not desert scrub.

Species	Habitat	Potential to Occur in Proposed Action Area (PAA)
Brack's fishhook cactus *(Sc/erocactus cloveriae* var. *brackil)*	Sandy-clay hills of the Nacimiento formation, desert scrub habitat, elevation 5000-6400 ft.	UNLIKELY: PPA is not located within ELM-designated potential "zone" for this species, geology is not Nacimiento, and habitat is not · desert scrub.
American peregrine falcon *(Falco peregrinus anatum)*	Rugged, semi-open to wooded areas, including open forests, farmlands, and cities. Nesting: Locally, typically ledges on vertical cliffs.	POSSIBLE: Open pinon-juniper habitat within PAA.
Bald eagle *(Haliaeetus leucocephalus)*	Typically within 2.5 mi of river or lake that supports fish or waterfowl, but may be in areas where other resources (such as carrion) available.	POSSIBLE: PAA is greater than 2.5 *mi* from river or lake that supports fish or waterfowl. However, bald eagles could potentially use the PAA for foraging.
Burrowing owl *(Athene cunicularia)*	Open grasslands. Nesting: abandoned animal burrows.	UNLIKELY: No grasslands or appropriate burrows within PAA.
Ferruginous hawk *(Buteo regalis)*	Open country, including prairies, badlands, sagebrush shrubland, desert scrub, and the periphery of pinon-juniper woodlands. Nesting: lone trees, cliff ledges, rock spires, or powerline towers.	UNLIKELY: No open country within vicinity ofPAA
Golden eagle *(Aquila chrysaetos)*	Open country, including open forests. Nesting: Cliff ledges or scattered large trees.	POSSIBLE: Open forest habitat within PAA.
Mountain plover *(Charadrius montanus)*	Areas with very short vegetation, >30% bare ground, and flat to gentle slopes.	UNLIKELY: Vegetation within PAA is not short and there are no large areas of bare ground.
Prairie falcon *(Falco mexicanus)*	Arid, very open areas, particularly areas with short vegetation, scrub habitat, or large areas of bare ground.	UNLIKELY: Habitat is not arid and very open within PAA.
Yellow-billed cuckoo *(Coccyzus americanus)*	Cottonwood woodlands, willow riparian oodlands, deciduous woodlands, moist thickets orchards, or overgrown pastures.	UNLIKELY: No cottonwood, riparian, or deciduous woodlands; moist thickets; orchards; or overgrown pastures within PAA.

According to the most recent BLM-FFO raptor nest geographic information system (GIS) data, no active raptor nests are located within 1/3 mile of the proposed action area.

American peregrine falcon *(Falco peregrinus anatum)*

Peregrine falcons may be found in the region year-round (Wheeler 2003). Peregrine falcons prefer open habitats, such as tundra, moorlands, steppe, seacoasts, mountains, open forests, and human population centers (NatureServe 2010). In the interior U.S., during the summer, this species can be found in rugged, semi-open and wooded, often

montane regions. They prefer areas with rocky cliffs, outcrops, and canyons (greater than 30-feet high) adjacent to lakes, rivers, or streams. They often nest on ledges or holes on the faces of rocky cliffs (at least 30 feet high) or crags, on river banks, on tundra mounds, in open bogs, in tree hollows, in other species' large stick nests, and on man-made structures. Locally, nests are typically found on ledges of vertical rocky cliffs. During the winter, lower-elevation pairs may remain in summer breeding habitat, while higher-elevation or northern latitude pairs may move south or to lowland habitat that often Jacks cliffs (Wheeler 2003).

The proposed action area could potentially provide foraging habitat for this species. There are no appropriate nesting sites within the proposed action area. The nearest peregrine falcon nest is 10 miles north-northwest of the proposed action area. No evidence of this species was observed during the survey of the proposed action area.

Bald eagle *(Haliaeetus leucocephalus)*
Bald eagles are typically found in northwestern New Mexico only during the winter (Wheeler 2003). They typically prefer habitat within 2.5 miles of coastal areas, bays, rivers, lakes, or other bodies of water that provide fish or waterfowl (NatureServe 2010). However, during the winter, if sufficient prey is available, eagles may be found in areas that lack water (Wheeler 2003). This species prefers to roost in conifers or other sheltered sites in the winter. Communal roost sites, used by two or more eagles, are common. Bald eagles typically avoid areas with nearby human activity and development (NatureServe 2010).

The proposed action area is more than 2.5 miles from the nearest waterbodies that provide fish or waterfowl. However, the proposed action area could potentially be used for foraging. No bald eagles were observed during the survey of the proposed action area.

Golden eagle *(Aquila chrysaetos)*
Golden eagles may be found in northwestern New Mexico year-round (Wheeler 2003). Golden eagles are generally found in open country, including prairies, tundra, open wooded areas, and barren areas. They prefer hilly or mountainous regions (NatureServe 2010). They may be found in areas with light agricultural use, but are rarely found in rural areas. They prefer areas with elevated perches. Nesting birds will utilize embankments or cliffs, or flat to moderate areas with scattered large trees. During the summer, they may be found above timberline; in the winter, they are typically only found below timberline, and may be found in moderate agricultural areas (Wheeler 2003).

The proposed action area could potentially provide foraging habitat for this species. No nesting sites are provided within the proposed action area. The nearest golden eagle nest is approximately seven miles to the west. No golden eagles or nests were observed during the biological survey of the proposed action area.

3.18 Recreation

The objective of the BLM-FFO outdoor recreation program is to ensure the continued availability of public lands for an array of resource-dependent recreation opportunities. Recreation use is managed to protect visitors, protect resources, resolve user conflicts, and stimulate the enjoyment of public lands. Recreation SDAs are managed to accommodate a large variety of recreational uses and outdoor recreational experiences. The proposed action area is not within a recreation SDA. BLM-FFO areas located outside of recreation SDAs are managed as Extensive Recreation Management Areas (ERMAs). ERMAs are managed to maintain a freedom of recreation choice

with limited regulatory constraints. In ERMAS, few recreation facilities or supervisory efforts exist. Dispersed recreational use in ERMAs may include occasional hunting during the hunting season.

3.19 Visual Resources

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. There are four VRM classes (Classes I through IV) which identify suggested degrees of allowed human modification in a landscape. Class I allows the least modification and Class IV allows the most (RMP 2003).

The 2003 RMP based interim VRM classes on a 1978-80 Visual Resource Inventory (VRJ) of the BLM-FFO area (BLM-FFO Interim VRM Office Policy 2011). A VRI is a scenic quality evaluation, a visual sensitivity level analysis, and a delineation of distance zones. The 2003 VRM classifications pended the completion of a new VRI that would meet current BLM guidance (RMP 2003).

In 2009, a new VRI was completed for the BLM-FFO area. This VRI indicated that the landscape has changed substantially since the 1978-80 VRJ, warranting the need for an amendment to the RMP to address visual resources. Therefore, on June 13, 2011, the BLM-FFO filed a Notice of Intent (FR Doc. 2011-14491) to prepare an RMP amendment and EA for visual resources. The BLM-FFO will continue to honor all valid, existing rights and resource allocations discussed in the RMP (BLM-FFO Interim VRM Qffice Policy 2011). In the interim, until the amendment has been signed, 2003 VRM and 2009 VRI classifications will both be discussed during the EA process.

With the exception of specific sites (none of which include the proposed action area), all areas of Frances Mesa ACEC are designated as VRM Class III. Class III is managed to "…[p]artiaJiy retain the existing character of the landscape. The level of change to the landscape should be moderate. Management activities may attract attention, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape" (RMP/FEIS 2003).

The proposed action area is within 2009 VRI Class IV. The VRI class does not take into account general management prescriptions for designated areas, such as Frances Mesa ACEC.

The proposed action area overlaps an existing gas well pad and access road. U.S. Highway 64, approximately 0.5 mile to the southwest, is visible from the proposed action area.

3.20 Noise

Increases in the level of sound (noise) generated from the production and pipeline transportation of oil and gas has occurred in the San Juan Basin over the last several years. These increases are generated primarily from the escalating need to use equipment such as compressors and pumping units, which operate on a continual basis. The increase in noise affects natural resource values and management of a number of agency SDAs, ACECs, research natural areas (RNAs), etc. The proposed action area is within Frances Mesa Cultural ACEC, although there are no noise stipulations associated with this location within the ACEC. Noise stipulations apply to Frances Ruin; the proposed action area is approximately 4.0 miles west of Frances Ruin.

3.21 Paleontology

The proposed action area is located within the paleontologically rich area of the San Juan Basin of northern New Mexico. The BLM uses the Potential Fossil Yield Classification (PFYC) system

to identify areas with a high potential to produce significant fossil resources (BLM 2008b). This system has ranked all lands within the BLM-FFO management area as a Class 5 PFYC designation. Class 5 designations are described as being Very High Potential paleontological resources areas, thus potentially requiring an assessment at the project level (IM 2008-009).

The BLM's PFYC system is a predictive modeling tool that was developed to provide baseline guidance for assessing and mitigating paleontological resources. It is intended to be used at an intermediate point in analyses and should be used to assist in determining the need for further mitigation assessment or actions. Using the PFYC system, geologic units are classified based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils, and their sensitivity to adverse impacts.

The BLM-FFO also recognizes nine SDAs, totaling more than 135,000 acres, which preserve important paleontological resources for scientific study and other public benefits (BLM 2003b:4-117). The proposed action area is not within the vicinity of any paleontological SDAs.

The proposed action would be assessed individually based on the BLM's PFYC system, known paleontological locality information, existing reports, and data for the area. If preliminary analysis indicates that the proposed action falls within a paleontological SDA or has a high probability of impacting paleontological resources, additional surveys, reporting, and stipulations would be required.

The proposed action area is within the San Jose Formation, a geologic unit ranked as PFYC Class 5 for very high paleontological sensitivity (BLM 2008b), which could entail project-specific assessments. The San Jose Formation of the San Juan Basin is the most extensively preserved and exposed Eocene Rock-stratigraphic unit in New Mexico. The formation has yielded one of the largest and most diverse vertebrate faunas of early Eocene age collected in North America. Fossil plants from lacustrine strata within the San Juan Basin are the only flora described from the San Jose Formation.

Based on local knowledge of the area from numerous projects, the analyses conducted for the 2003 RMP, and the fact that the proposed action area is not located within a paleontological SDA, there are few paleontological resources assumed to be in the proposed action area; the BLM-FFO does not require a site-specific paleontological survey of the proposed action area.

4.0 Environmental Consequences

Effects can be long term (permanent or residual) or short term (incidental or temporary). Short-term impacts affect the environment for only a limited period of time; the environment reverts to pre-action conditions (usually within one to three years). Long-term effects are substantial and permanent alterations to the pre-existing environmental condition; the effects last longer than three years.

Alternative A -No Action Alternative

Under the No Action Alternative, neither Alternative B nor an alternative location for the proposed well would be realized. The No Action Alternative would result in the continuation of the current land and resource uses in the action area. The No Action Alternative would result in no effect to each resource discussed within this section. No mitigation would be required.

Alternative B - Proposed Action

Under the proposed action, all proposed actions listed, including site-specific mitigation measures, would occur. For a complete description of the proposed action, see Section 2.2, Alternative B — Proposed Action. The proposed action would result in 1.10 acres of new surface disturbance. Following interim reclamation, no long-term surface disturbance would remain. The table below summarizes the long- and short-term disturbance resulting from the proposed action.

Table 7: Summary of New Disturbance

Facility	Acreage of New Disturbance – Long Term	Acreage of New Disturbance – Short Term	TOTAL
Well Pad	0	1.04	**1.04**
Access Road	N/A	N/A	**N/A**
Pipeline	0	0.06	**0.06**
TOTAL	0	**1.10**	**1.10**

Potential disturbance resulting from the proposed action has been divided into three categories:

High — As defined in CEQ guidelines (40 CFR 1500-1508), effects that are substantial in severity and therefore should receive the greatest attention in decision-making.

Moderate — Effects that cause a degree of change that is easy to detect, but that do not meet the criteria for significant impacts.

Low — Effects that cannot be easily detected and cause little change in the existing environment.

4.1 Air Resources

4.1.1 Direct and Indirect Effects

Air Quality

Air quality would temporary be directly impacted with pollution from exhaust emissions, chemical odors, and dust caused by motorized equipment used during construction, and by the drilling rig during well-drilling. Dust dissemination would discontinue upon completion of the construction phase. Air pollution from the motorized equipment would discontinue at the completion of the drilling phase. The winds that frequent the northwestern part of New Mexico generally disperse the odors and emissions. Other factors that currently affect air quality in the area include dust from livestock-herding activities, recreational use, and vehicles on roads.

Over the last 10 years, the leasing of the federal oil and gas mineral estate within the BLM-FFO has resulted in an average 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 airborne soil particles blown from new well pads or roads; exhaust emissions from drilling equipment, compressors, vehicles, and dehydration and separation facilities; and potential releases of GHG, NOx, and VOCs 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 BLM-FFO RMP demonstrated that 522 wells would be drilled annually for federal minerals. Current APD-permitting trends within the BLM-FFO 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 VOCs, 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, it 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 fireplaces), and power plant emissions from the west are also parts of the equation. In August 2006, regional air quality modeling

conducted for the Northern San Juan Basin Coal Bed Methane FEIS Project determined that potential cumulative visibility impacts to Federal Prevention of Significant Deterioration (PSD) Class I Areas (Mesa Verde National Park and the Wenimuche Wilderness Area) 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 EPA 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

The BLM-FFO has been a parttctpant in the Four Corners Air Quality Task Force (FCAQTF) since its inception in 2002, when it was known as the Four Comers Ozone Task Force. Because of the unanswered questions raised by 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; industry; interest groups; and concerned community members. The FCAQTF has several working groups, which 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 regulations, 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 FEISIRMP 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, which has been in effect since August 1, 2005. To date, NMAQB has made no other such requests.

Currently, development of 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 EIS/RMP. The impacts forecast by the RFD are still valid. At the time the 2003 EIS!RMP was written, ozone readings did not represent a violation of the NAAQS for this pollutant. The New Mexico Environment Department Air Quality Bureau has determined that the 2007 – 2009 ozone design value for San Juan County is

0.070 ppm. The design value for the county must be greater than the revised 8-hour ozone standard of0.075 ppm for a nonattainment designation.

The EPA's inventory data describes ''Natural Gas Systems" and ''Petroleum Systems" as the two major categories ofU.S. sources of GHG gas emissions. The inventory identifies the contributions of natural gas and petroleum systems to total $C0_2$ and CRt emissions (natural gas and petroleum systems do not produce noteworthy amounts of any of the other GHGs). Within the larger category of "Natural Gas Systems," the EPA 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 flaring hydrocarbons and gases at high temperatures in order to reduce emissions of incomplete combustion, requiring that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored, ensuring that compressor engines 300 horsepower or less have NOx emissions limited to 2 grams per horsepower hour, revegetating areas not required for production facilities to reduce the amount of dust, and watering dirt roads during periods of high use in order to reduce fugitive dust emission. The significant threshold for particulate matter of 35 ug/m³ daily PM2.5 NAAQS is not expected to be exceeded under the proposed action.

The EPA data shows that improved practices, improved 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 EPA's Natural Gas Energy Star program. The BLM-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 Surface and Groundwater Quality and Quantity

4.2.1 Direct and Indirect Effects

The disruption of area soils and the increase of barren surface associated with the proposed action would result in augmented surface flows with associated increased sedimentation and TDS. Sedimentation, resulting from both wind and water erosion, could be realized downgradient of the proposed action area. The quality and quantity of this surface sedimentation would be dependent upon wind and water events in relation to soil disturbance, the timing and success of reclamation, and erosion control configuration. There would be low short- and long-term effects on surface water resources.

The storage of drilling fluids and improper well casing and cementing represents the potential for seepage of petroleum products to groundwater aquifers, such as the local San Jose Formation. Accidental spill or discharge of drilling and production fluids stored onsite is also a latent hazard, as displaced fluids could migrate to surface or groundwater resources. There would be moderate short- and long-term effects on groundwater.

4.2.2 Mitigation

Fresh water for drilling and completion would be trucked to the location from permitted sources. Fluids stored on location or associated with the pipeline would be contained in tanks during all operations. Large, permanent storage tanks(s) would be enclosed within compacted, gravel-covered, earthen berms to contain any potential spills. A closed-loop system would be used, rather than a temporary reserve pit. Surface casing would be set at a depth specified by the BLM-FFO to protect shallow groundwater aquifers. The swift implementation of mitigation measures outlined for soils, topography, and vegetation would also curtail short- and long-term impacts to surface and groundwater quality and quantity. Re-establishment of perennial vegetation and installation of functional erosion-control devices outlined in BLM BMPs would decrease long-term soil erosion impacts and, consequently, impacts to surface and groundwater resources.

4.3 Hazardous or Solid Waste Materials

4.3.1 Direct and Indirect Effects

Typical wastes associated with the proposed action would include trash, sewage, produced water, and produced hyqrocarbons. With mitigation, impacts are expected to be low for the short and long term.

4.3.2 Mitigation

During drilling and completion, a trash receptacle and a chemically treated portable toilet would be on location for trash and sewer disposal. All produced hydrocarbons would be put in tanks on location during completion work. Produced water would be put in onsite tanks or within lined reserve pits during completion work. All wastes would be disposed of in 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 would 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 Comprehensive Environmental Response Compensation and Liability Act, 1980 (CERCLA) and under BNLM NTL-3A. The well location would have an informational sign, as directed under 43 CFR 3160.

4.4 Environmental Justice/Socio-Economics

4.4.1 Direct and Indirect Effects

Local and regional companies may be employed during construction, drilling, and production of the proposed well and associated facilities. This employment would result in an economic benefit to the local and regional community. No disruptions or disproportionate negative impacts to any communities or groups are anticipated. A moderate, short-term increase and low, long-term increase in socio-economics is anticipated.

4.4.2 Mitigation

No mitigation is proposed.

4.5 Cultural Resources

4.5.1 Direct and Indirect Effects

Direct effects normally include alterations to the physical integrity of a cultural resource. If a cultural resource is significant for other than its scientific information, direct effects may al--

include the introduction of audible, atmospheric, or visual elements that are out of character for the cultural site. A potential indirect effect from the proposed action is the increase in human activity or access to the area with the increased potential of unauthorized removal or other alteration to cultural resources in the area. Based on a review of the archaeological reports and the assessment of the undertaking in this area, the BLM cultural resources staff has determined that the proposed action, with mitigation, would have no effect on cultural resources (BLM Report No. 2008(IV)055F). This determination would be included with the BLM-FFO cultural resources stipulations, if any, attached to the APD.

4.5.2 Mitigation

To protect LA 157548, a site protection barrier (temporary fencing) would be used to restrict the proposed construction zone. An archaeological monitor would also be required (BLM Report No. 2008 (IV)055F). Please refer to AAC Report No. 2007-084 and BLM Report No. 2008(IV)055F for further details.

All BLM-FFO cultural resources stipulations would be followed as indicated in the Cultural Resource Records of Review, 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. All employees, contractors, and sub-contractors of the project would be informed by the project proponent that cultural sites are to be avoided by all personnel, personal vehicles, and company equipment, and that it is illegal to collect, damage, or disturb cultural resources, and that such activities are punishable by criminal and or administrative penalties under the provisions of the Archaeological Resources Protection Act (16 U.S.C. 470aa-mm).

In the event of a new discovery during construction, the project proponent would immediately stop all construction activities in the immediate vicinity of the discovery and immediately notify the archaeological monitor, if present, or the BLM. The BLM would then evaluate or cause the site to be evaluated. Should a discovery be evaluated as significant (e.g., National Register, NAGPRA, ARPA), it would be protected in place until mitigating measures can be developed and implemented according to guidelines set bytheBLM.

4.6 Native American Religious Concerns

4.6.1 Direct and Indirect Effects

The proposed action is not known to physically threaten the integrity of 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 ATRFA or EO 13007. There are currently no known threats to remains that fall within the purview ofNAGPRA or ARPA.

4.6.2 Mitigation

No mitigation is proposed.

4.7 Federally Listed Threatened or Endangered Species

4.7.1 Direct and Indirect Effects

Based on habitat and range, the potential does not exist for any Federally listed species to occur within the proposed action area. No Federally listed species were observed during the survey of the proposed action area. As required under Section 7 of the Endangered

Species Act of 1973, the BLM-FFO submitted a Biological Assessment (BA) to the U.S. FWS in association with the BLM-FFO 2003 Draft RMP/Draft EIS. This assessment described the potential impacts on threatened and endangered species, as a result of management actions presented in the BLM-FFO Draft RMP/Draft EIS. In a letter dated October 2, 2002, the USFWS concurred with the BLM-FFO (Consultation No. 2-22-01-389). The USFWS states:

> "The [USFWS] concurs with the BLM's determination in the BA of "may affect, not likely to adversely affect" Knowlton cactus, Mesa Verde cactus, Mancos milkvetch, Colorado pikeminnow and its critical habitat, razorback sucker, bald eagle, mountain plover, Mexican spotted owl and its critical habitat, and the southwestern willow flycatcher."

No further consultation with the USFWS is required.

4.7.2 Mitigation

No mitigation is proposed.

4.8 Invasive, Non-Native Species

4.8.1 Direct and Indirect Effects

Indirect effects of increased human traffic in the area, especially any interstate traffic, may result in establishment of invasive/noxious weeds. Invasive/noxious plants generally outcompete native species where bare ground is created. Given successful mitigation measures, effects from invasive, non-native species are expected to be low for the short and long term.

4.8.2 Mitigation

The proposed action area would be seeded with certified weed-free seed. It would be ConocoPhillips's and Enterprise's responsibility to monitor, control, and eradicate all noxious/invasive weeds within the proposed action area during the life of the project.

4.9 Areas of Critical Environmental Concern (ACECs)

4.9.1 Direct and Indirect Effects

The proposed action area would result in 1.10 acres of short-term disturbance within Frances Mesa Cultural ACEC. Development within the ACEC would reduce the pristine areas and the distance from cultural values to disturbance. Development within the ACEC may also affect the experience of those coming to the ACEC for traditional or recreational uses. Direct and indirect effects are anticipated to be moderate for the short term and long term.

Indirect impacts to the viewshed within the ACEC would be limited to the four- to eight-week duration of actual construction; indirect impacts would be temporary and localized. Indirect impacts to the auditory area would likewise be temporary and very localized, with sound attenuating to background levels at approximately 0.25 mile from the construction site.

The BLM-FFO protects designated ACECs by limiting, as much as possible, surface disturbance within these areas. The BLM works with operators to twin or co-locate wells whenever feasible, thereby lessening the potential impacts. For the proposed action, directional drilling technology would be used, allowing the proposed well to be twinned

on existing well pad. No new access road would be required and required disturbance for the proposed pipeline tie would be limited to the well pad boundaries. Therefore, the proposed action is consistent with prescribed management actions in regard to oil- and gas-related activity within Frances Mesa ACEC.

4.9.2 Mitigation

The management goal of Frances Mesa Cultural ACEC is "to preserve cultural and recreational values" (BLM 2003b). Management prescriptions which apply to the proposed action are as follows.

- For Frances Ruin and Romine Canyon, which are within Frances Mesa Cultural ACEC, new and existing oil and gas leases are managed under the NSO constraint. For remaining acreage, existing oil and gas leases are managed under the Controlled Surface Use constraint.
- Class III cultural inventories will be conducted.
- No new ROWs are allowed in Frances Ruin and Romine Canyon. New ROWs must be placed within existing ROW/easement disturbance for additional acreage. Operators must coordinate with ROW/easement holders for maintenance and use of existing ROWs/easements.
- Class III VRM designations are enforced, with the exception of specified Class II Areas within Township 30 North, Range 06 West, Section 31.
- Other surface-disturbing activities, other than ROWs previously discussed, are restricted to minimize disturbance and impacts.
- Noise receptor points are designated at Frances Ruin-defmed sites. The remaining acreage has no designation.

Noise stipulations would apply to the proposed action. Low-profile equipment painted Juniper Green would be used.

4.10 Mineral Resources/Geology

4.10.1 Direct and Indirect Effects

Development of the Basin Dakota/Blanco Mesaverde reservoirs would result in extraction of a non-renewable resource. Cross-contamination between geologic zones could occur without adequate cementing and casing of the proposed well bore. With implementation of BLM-FFO standard drilling and completion requirements, short- and long-term effects to mineral resources and geology are anticipated to be low.

4.10.2 Mitigation

Sufficient well-control equipment and reserve pit volume are necessary to assure control of the well during drilling and completion operations. Adequate casing, cementing, mud weights, blow-out preventors, and reserve pit volumes are proposed in the APD to mitigate any potential down-hole impacts.

4.11 Soils

4.11.1 Direct and Indirect Effects

New disturbance associated with the proposed action would be approximately 1.10 acres; there would be no new, long-term disturbance. Soils that would be disturbed would be structurally mixed, displaced, and exposed to the efements of wind and water erosion. In some areas, these soils would also be compacted. Once disturbed, these soils (especially in cut-and-fill slope areas) can be subject to increased erosion, dependent upon storm events of water and/or wind, until reseeding has been establishe9 (one to two growing seasons). The heaviest erosion into the watershed would be low for the short term until revegetation is established. The heaviest amounts of wind and water erosion would be low for the short and long term.

4.11.2 Mitigation

During interim reclamation, all new disturbance would be reclaimed. Site-specific drainage and erosion mitigation measures for the well pad and associated facilities are detailed in Section 2.2 Alternative B- Proposed Action. Re-establishment of perennial vegetation and installation of functional erosion-control devices outlined in BLM BMPs would decrease long-term soil erosion effects.

4.12 Watershed/Hydrology

4.12.1 Direct and Indirect Effects

The proposed action would affect the watershed and its hydrology, as discussed in Section 4.2.1 Surface and Groundwater Quality and Quantity - Direct and Indirect Effects. With the implementation of mitigation measures described in Section 4.2.2 Surface and Groundwater Quality and Quantity- Mitigation, impacts to the Watershed and its hydrology would be low for the short and long term.

4.12.2 Mitigation

Mitigation measures described in Section 4.2.2 Surface and Groundwater Quality and Quantity – Mitigation would be applied to curtail impacts to Gobemador Canyon Watershed and its hydrology.

4.13 Vegetation/Forestry

4.13.1 Direct and Indirect Effects

The proposed action would result in the disturbance of approximately 1.10 vegetated acres; much of this vegetation consists of reseed species associated with previous reclamation activities. Disturbance would include the removal of all vegetation within the limits of the proposed action area, including approximately 50 trees. Following interim reclamation, vehicular activity would be restricted to existing access roads, as well as to approximately 1.20 previously disturbed acres on the well pad. No long-term disturbance is expected to result from the proposed action. With mitigation, the proposal is projected to have moderate short-term and long-term effects on area vegetation.

4.13.2 Mitigation

Under the proposed action, following completion of the well, disturbed areas not needed for operations and vehicular traffic would be immediately re-contoured and seeded with a BLM-FFO-prescribed seed mixture. The establishment or re-establishment of vegetation is expected to take three to five growing seasons, depending on precipitation.

4.15 Migratory Birds

4.15.1 Direct and Indirect Effects

The proposed project would remove approximately 1.10 acres of open pinon-juniper habitat around an existing gas well. All vegetation would be removed within this area, including approximately 50 juniper trees. These trees provide perches and nesting sites for birds. Following interim reclamation, the re-establishment of vegetation is expected to take three to five growing seasons, depending on precipitation. The re-establishment of mature trees would take much longer than five years. There would be no new, long-term surface disturbance.

Based on the information available from the North American Breeding Bird Survey routes, it appears that the likelihood of more than one migratory bird nest in the project area is low. No old nests left from the previous breeding season or other evidence of these species was detected during field visit. The amount of projected habitat removal is negligible when compared to the total amount of available habitat. Actual potential effects on birds in the proposed action area are difficult to predict. Ongoing studies have shown mixed effects of oil and gas development, including compressor noise, on nesting migratory birds. Frances and Ortega (2006 unpublished report to BLM) found no significant difference in nest density or nest success between sites with or without wellhead compressors. Some species, such as the black-chinned hummingbird and house finch, were more common on sites with compressors while others, such as the mourning dove and spotted towhee, appeared to either avoid or nest further from compressors. Holmes and King (2006) found that the sage sparrow had lower nest survival in an area with ongoing gas development, while the Brewer's sparrow had higher survival rates when compared with populations in an undeveloped control area.

With the implementation of any proposed mitigation measures, effects to migratory birds are anticipated to be moderate for the short and long term.

4.15.2 Mitigation

The BLM-FFO Interim Management Policy regarding the Migratory Bird Treaty Act (per Instruction Memorandum No. NM-F00-2010-001, dated February 2010) establishes mitigation measures to minimize the possibility of unintentional take of migratory birds. For projects with less than 4.0 acres of vegetative disturbance, should active nests be observed within the proposed action area, construction would cease and a BLM-FFO biologist should be contacted immediately.

Following drilling, all new disturbance would be reclaimed. All construction activities would be confined to permitted areas only. Rapid and permanent vegetation and cover reestablishment would minimize impacts to migratory birds. All bird hazards associated with construction and operation of the proposed action would be contained in storage tanks.

4.16 Range

4.16.1 Direct and Indirect Effects

The proposed action's surface disturbance would result in the temporary loss of approximately 0.08 AUM (at an estimated 13.5 acres per AUM). Following successful revegetation of construction zones, it is estimated that no AUMs would remain disturbed for the long term. If the area is successfully and immediately revegetated following initial construction and following final abandonment, the proposed action may benefit livestock

4.N Wildlife

4.14.1 Direct and Indirect Effects

The proposed action would result in the disturbance of approximately 1.10 acres of open pinon-juniper habitat surrounding an existing well pad. All vegetation within this acreage would be removed, including approximately 50 juniper trees. Following interim reclamation, the re-establishment of vegetation is expected to take three to five growing seasons, depending on precipitation. The re-establishment of mature trees would take much longer than five years. There would be no new, long-term surface disturbance.

Effects of oil and gas development on terrestrial flora and fauna can result from dust, noise, increased human activity due to greater road access, and habitat fragmentation (BLM 2003b). Some wildlife species react positively to certain oil and gas activities, some react negatively, and some show no reaction at all. Species would continue to inhabit the area or conversely move out of the area, and populations may increase or decrease depending on the available adjacent forage and habitat present.

Increased vehicular traffic and human activity in the area could have a negative impact due to disturbance and potential road kills to big game and other wildlife species, especially during construction and drilling. Light truck traffic would continue yearlong, at approximately the present level following construction and drilling. There are no published studies of effects of oil and gas development on deer or elk in the San Juan Basin. Recent research in other areas may or may not be applicable. Sawyer et al. (2005) examined winter habitat selection of mule deer before and during development of a natural gas field, in the sagebrush and sagebrush-grassland communities of the Pinedale Anticline Action area of Wyoming. Results of this study recorded mule deer avoidance of otherwise suitable habitats within 2.7-3.7 kilometers of natural gas wells and suggested substantial indirect habitat loss from energy development. Observed shifts in deer distribution as the study progressed were toward less-preferred and presumably less suitable habitats Sawyer et al (2005) conducted their study in an area of extensive rolling sagebrush with little topographic relief, high deer populations, and little oil and gas development. The high level of existing development in the BLM-FFO, as well as the more diverse habitat types and broken topogra phy, make assumptions of similar impacts difficult.

The BLM-FFO area contains approximately 633,000 acres of pinon-juniper habitat (BLM 2003b). The woodland habitat may offer greater cover and seclusion for wintering wildlife than in the aforementioned study. Road densities within the BLM-FFO area are already approximately 10 times greater than those in the Wyoming study, yet the area still supports deer and elk populations.

With implementation of proposed mitigation measures, direct and indirect wildlife effects are anticipated to be low for the short and long term.

4.14.2 Mitigation

All construction acttvtttes would be confined to permitted areas only. All wildlife hazards associated with construct ion and operation would be fenced or contained in storage tanks. During interim reclamation, all new disturbance would be reclaimed. Following interim reclamation, cover reestablishment would minimize impacts to wildlife. BLM-FFO-designated seed mixture would be used during interim and final reclamation.

grazing by providing additional forage above the existing indigenous rate of production. Impacts to range and grazing livestock are anticipated to be low in both the short and long term.

4.16.2 Mitigation

During interim reclamation, all new disturbance would be reclaimed. All hazards to livestock and wildlife would be fenced or contained. All project activities would be confined to permitted areas only. No livestock improvements would be impacted.

4.17 Special Management Species

4.17.1 Direct and Indirect Effects

The American peregrine falcon, bald eagle, and golden eagle could potentially use the proposed action area for foraging. Impacts of the proposed action would include changes in vegetation composition and a temporary increase in human intrusion into the area, which may affect the movements of prey species. This human intrusion would result in increased noise, dust, and vehicles.

Short- and long-term effects to SMS are expected to be low.

4.17.2 Mitigation

No mitigation measures are proposed.

4.18 Recreation

4.18.1 Direct and Indirect Effects

The proposed well, its associated facilities, and its associated human activities may be visible and audible *to* recreationists, such as hunters, within the immediate area. The presence of the well would not be expected to interfere with hunting or other recreational actlV!ttes. Given implementation of BLM-FFO standards, effects from the proposed action are anticipated to be low for the short and long term.

4.18.2 Mitigation

Rapid construction and reclamation would decrease the period of greatest visual impact. Using low-profile equipment painted Juniper Green would lessen visual impacts (for safety purposes, some equipment or parts of equipment may be required to be painted other, appropriate colors). During interim reclamation, all new disturbance would be reclaimed. The goal of reclamation would be to diminish evidence of cuts, fills, and flat well pad surfaces.

4.19 Visual Resources

4.19.1 Direct and Indirect Effects

The proposed action *would* result in the short-term removal of 1.10 acres of vegetation, including approximately 50 trees. The proposed action would result in vegetation alteration and visual scars to the landscape. Although no new, long-term surface disturbance would remain after interim reclamation, additional production equipment would be added to the existing well pad. Under the proposed action, visual resource management objectives for VRM III would be achieved. With the implementation of BLM-FFO standard and site-specific mitigation measures, the effects of the proposed action on visual resources are anticipated to be moderate for the short term and low for the long term.

4.19.2 Mitigation

Rapid construction and reclamation would decrease the period of greatest visual impact. Using low-profile equipment painted Juniper Green would lessen visual impacts (for safety purposes, some equipment or parts of equipment may be required to be painted other, appropriate colors). During interim reclamation, all new disturbance would be reclaimed. The goal of reclamation would be to diminish evidence of cuts, fills, and flat well pad surfaces.

4.20 Noise

4.20.1 Direct and Indirect Effects

During project construction, short-term noise within the vtcmtty would moderately increase. Noise impacts during the construction phase would result from the operation of vehicles and construction equipment. Not all construction equipment operates continuously, so the average noise level during well pad and pipeline construction is estimated to be 85 dBA. Although modified by topography, the average noise levels decrease below 55 dBA about 1,700 feet from construction sites (SJPLC 2006). Generally, any areas within 1,500 feet of construction would experience temporary noise levels above 55 dBA during daylight hours. Nighttime noise levels are not usually affected, because construction occurs between 7:00a.m. and 7:00 p.m. Noise during the drilling phase would also be elevated above pre-existing levels. Subject to area topography, typically the noise from a drilling rig is 74 dBA at 200 feet. Noise from drilling rigs would decrease from 60 dBA at 1,000 feet to 50 dBA at 3,000 feet (SJPLC 2006). These levels are experienced for 24 hours per day for the time required to drill and complete the proposed well.

Under the proposed action, noise levels would decrease substantially after the well pad and pipeline tie have been constructed and the well drilled. Sources of operational noise would involve periodic vehicle trips to the well sites and the operation of production equipment. Subject to topography, typical noise from a pumping unit is 6ldBA at 100 feet for up to 24 hours per day. Noise from pump jacks would decrease to 55 dBA at 200 feet and 41 dBA at 1,000 feet. The noise from a pump jack is rhythmic, rather than the steady sound of smoothly running equipment. Therefore, although the noise level would be well below the 55-dBA significance threshold, it may be perceived as higher noise levels for some people. Noise from one **(I)** compressor engine enclosed in a building is about 89 dBA at five (5) feet. Noise from a compressor engine enclosed in a building typically is 69 dBA measured 50 feet from the edge of the building (SJPLC 2006). Therefore, under the proposed action (Alternative B), a moderate short-term noise increase in both the project and existing road area is anticipated. Given the implementation of the mitigation measures under the proposed action, during the production phase area noise would be low for the long term.

4.20.2 Mitigation

The BLM-FFO would require sound abatement on any production equipment used during the production phase of the proposed action. All proposed activities would be required to comply with the noise standards as established in NTL 04-2 FFO (Appendix C).

4.21 Paleontology

4.2I.1 Direct and Indirect Effects

Although no paleontological resources are known to occur within the proposed action area, impacts to paleontological resources from the proposed action could possibly occur.

Direct impacts from the proposed action to fossil localities could result from ground-disturbing activities or the disturbance of the stratigraphic context in which they are located. The proposed action could also create indirect impacts to areas by changing erosion patterns and increasing off-road vehicular access near the proposed action area to recreationists. An increase in human activity in the area could increase the possibility of unauthorized removal of or other alterations to paleontological resources in the area. Potential impacts to paleontological resources as a result of the proposed action would be low for the short and long term.

4.21.2 Mitigation

All BLM-FFO paleontological resources stipulations would 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, action area reduction and/or specific construction avoidance zones, and employee education. Upon review, a determination for final project clearance and stipulations would be issued by the BLM-FFO.

If previously undocumented paleontological sites are encountered during construction, all activities would stop in the vicinity of the discovery and the BLM would 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 paleontological resources.

4.22 Residual Effects

The effects of the proposed action that remain after mitigation are residual impacts. Residual impacts of the proposed action include effects to local air quality by increased combustion emissions, changes in site topography, changes in soil constitution, and changes in vegetation composition. Combustion emissions may increase during the production phase of the proposed project. The proposed action would result in 1.10 acres of new, long-term surface disturbance. An unquantified amount of increased soil loss, erosion, sedimentation, and degradation of surface water quality and quantity would result. Additionally, the potential for the loss of cultural materials or paleontological resources exists, primarily as a result of indirect human actions. The proposed action would alter the landscape and increase visual scarring in the area surrounding the proposed well. Noise in the vicinity of the proposed well would increase for the short term. Long-term vicinity noise may also increase, dependent upon the production equipment utilized. To keep all impacts below the level of significance, implementation of recommended APD COAs would be necessary.

4.23 Cumulative Effects

The leased area of the proposed action has been industrialized with oil and gas well development. For each project that has been permitted, there has been an increase in long-term surface disturbance and fragmentation. As wells become unproductive, well pads and access roads are reclaimed. Thus, cumulative impacts fluctuate with the construction and reclamation of well pads and facilities. Preserving as much land as possible and a_pplying appropriate mitigation measures would alleviate the cumulative impacts.

Within a one-mile radius of the proposed action area, there are 25 new or active wells on 29 well pads, and approximately 8.9 miles of existing roads. Assuming an average disturbance area of 1.2 acres per well pad and an average road width of 30 feet, this totals 62.4 acres of existing disturbance in the area. The proposed action, with no long-term surface disturbance, would not increase long-term disturbance in the region.

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 pennit 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 dependent on historic water conditions. Forests at higher elevations in New Mexico, for example, have been exposed to wanner 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.

The foremost past, present, and potential future human activity resulting in environmental disturbance in the Upper San Juan Watershed is oil and gas development. Other human activities within the sub-watershed include hunting, general public recreation, and livestock grazing operations. Impacts from these activities on the Upper San Juan Watershed environment are categorized as low, for the present and future (long-term). Energy development activities can be separated into short- and long-term disturbances. Short-term disturbance consists of pipeline routes and reclaimed portions of well pads. This acreage is usually reclaimed within one to two years. Long-term acreage disturbance are those areas needed for well production and vehicular travel (roads), estimated at one acre per well location. Some wells are twinned, or share a well pad location, decreasing the long-term surface acreage requirement. For this analysis, it is assumed that reclamation and mitigation measures have been successful, with each past, present and future well representing an estimated 0.78 acre per well.

The Upper San Juan Watershed contains approximately 657,318 acres with an estimated 3853 existing oil and gas wells and 24,978 acres of existing, long-term oil and gas disturbance (2003 PRMP/FEIS). Given the current NMOCC spacing orders of 18 wells per section, the "twinning" of some wells, and the reasonable foreseeable development predictions in the 2003 PRMP/FEIS, the total number of wells the Upper San Juari Sub-Watershed is estimated to be 5869 in the reasonably foreseeable future. Thus, reasonable anticipated future development would include approximately 2016 additional wells. Assuming that the existing roads are adequate, this calculates to approximately 1573 additional acres of long-term well pad development that can be expected in the Upper San Juan Sub-Watershed. Total long-term, reasonably foreseeable long-term development disturbance would be approximately 2361 acres. The proposed action would result in no long-term disturbance, and thus would not contribute to this development.

The short-term use of the area for the proposed action is not expected to adversely impact or limit the long-tenn productivity of the land, or nearby lands. There is no irreversible or irretrievable commitment of surface resources that would occur from the proposed action.

5.0 consultation/Coordination

The following agencies and individuals contributed to the preparation of this document:

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Nelson Consulting, Inc. has prepared this environmental assessment document to the standards and guidelines set by the BLM-FFO. Selected sections and information within this document were specifically written by the BLM-FFO. This document is the property of the BLM-FFO.

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APPENDIX A

SELECTED LAWS AND REGULATIONS GOVERNING FEDERAL OIL AND GAS DEVELOPMENT

SELECTED LAWS AND REGULATIONS THAT GOVERN FEDERAL OIL AND GA§ DEVELOPMENT

LAW/REGULATION	RESOURCE PROTECTED	AUTHORITY
Clean Air Act (CAA)	Air Quality, Air Emissions and Permits.	New Mexico Environment Department (NMED)
Clean Water Act (CWA) 1977, as amended. Section 404 Permits.	Surface waters of the U.S., crossing/diversion of ephemeral washes	U.S. Army Corps of Engineers
Federal Water Pollution Control Act and Section 404 of the CWA.	Discharges into surface waters from point sources	New Mexico Water Quality Control Commission (NMWQCC)
Storm Water Pollution Prevention Plan (SWPPP), Section 402 of the CWA	Construction projects disturbing greater than 5 acres. Minimize erosion	USEPA
Safe Drinking Water Act 1974, as amended.	Surface and groundwater	U.S. Environmental Protection Agency (USEPA)
Colorado River Salinity Control Act 1974, amendment of 1984: Public Law 93-320	Mandated Control of Salinity Runoff into the Colorado River Basin	BLM
Federal Land Management and Policy Act (FLPMA) of 1976.	BLM unique areas, ACECs. Issuing of energy related ROWS. Wilderness Areas	BLM
Surface Mining Control and Reclamation Act (SMCRA) of 1977.	Prime and Unique Farm Lands.	Natural Resource Conservation Service (NRCS)
Executive Order 11988 as amended.	Floodplains	All Agencies
Executive Order 11990.	Wetlands/Riparian Zones	All Agencies
Wild and Scenic Rivers Act of 1968 as amended.	Wild and Scenic Rivers	All Agencies
National Historic Preservation Act of 1966 as amended. Antiquities Act of 1906.	Cultural resources	All Agencies
American Indian Religious Freedom Act 1978. Native American Graves Protection and Repatriation Act (NAGPRA) 1990.	Native American Religious Concerns	All Agencies
Endangered Species Act (ESA) 1973 as amended. (Section 7)	Threatened and Endangered plant and animal species	U. S. Fish and Wildlife Service (U.S. FWS)
Bald and Golden Eagle Protection Act	Protection of Eagles	
Migratory Bird Treaty Act	Protection to Migratory Birds, Nests and Eggs.	U.S. FWS
National and New Mexico BLM Instruction Memoranda	BLM and New Mexico State Sensitive Species and Habitat.	BLM
Resource Conservation and Recovery Act (RCRA) of 1976	Use of Hazardous Materials	USEPA
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) 660 as amended.	Use and Disposal of listed Hazardous Materials.	USEPA
Executive Order No.22898, February 1994.	Environmental Justice for environmental and health conditions in minority and low-income communities.	All Agencies
Federal Noxious Weed Act 1974, as amended and Executive Order 13112.	Designated Certain Plants as Noxious Weeds.	All Agencies
New Mexico Noxious Weed List	Noxious weeds for the State of New Mexico.	New Mexico Department of Agriculture.
Mineral Leasing Act (MLA) 1929, as amended. Associated Onshore Orders; National, State and Local.	Issue and managed federal oil and gas leases and related transportation pipelines.	BLM

APPENDIXB

SURVEY PLATS

DISTRICT I
1625 N. French Dr., Hobbs, N.M. 88240

DISTRICT II
1301 W. Grand Avenue, Artesia, N.M. 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, N.M. 87410

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OIL CONSERVATION DIVISION
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Santa Fe, mL 87605

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O AllENDED REPORT

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10 Surface Location

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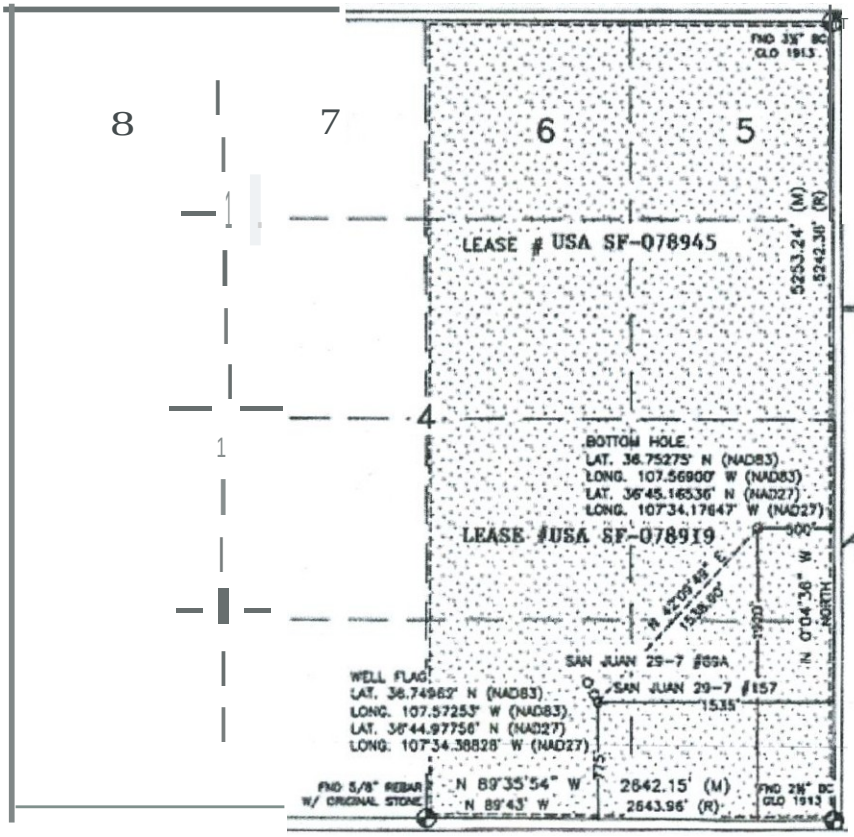

OPERATOR CERTIFICATION

Signature Date

Printed Name

18 SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

SEPTEMBER 14, 2007

Date of Survey

Signature and Seal of Professional Surveyor:

DAVID RUSSELL

LATITUDE: 36.7-496rN
LONGilUOE:107.57253•W
DATUM: NAD 83

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BURUNGTON RESOURCES O&G CO LP

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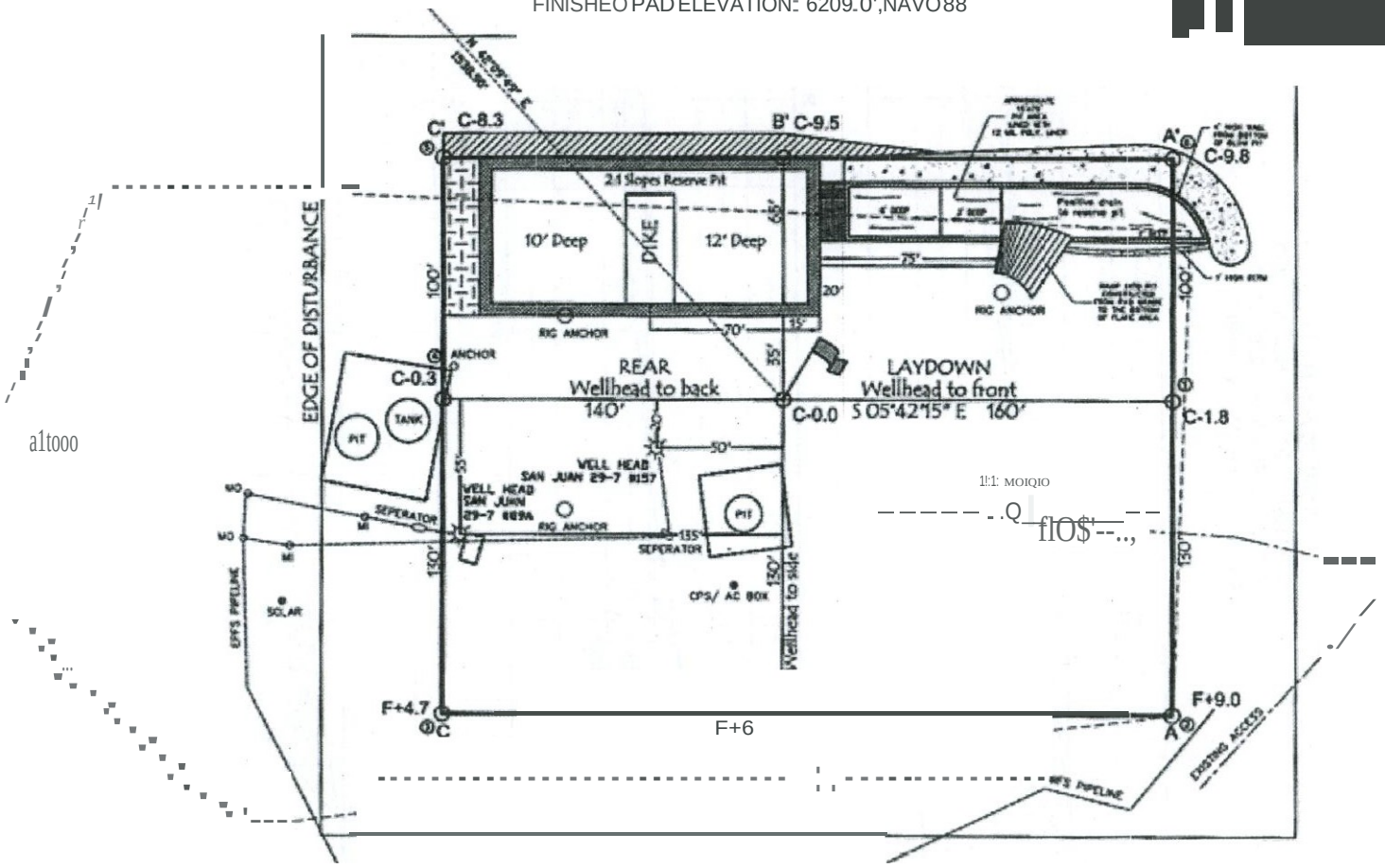
GROUND ELEVATION:62Cl9", NAVD 88
FINISHEO PAD ELEVATION: 6209.0',NAVO 88



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(505) 3:14-tl37

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LONGITUDE: 107.57253'W
DATUM: NAD 83

BURLINGTON RESOURCES O&G CO LP
SAN JUAN 29-7 UNIT ti82M
775'FSL & 1535' FEL
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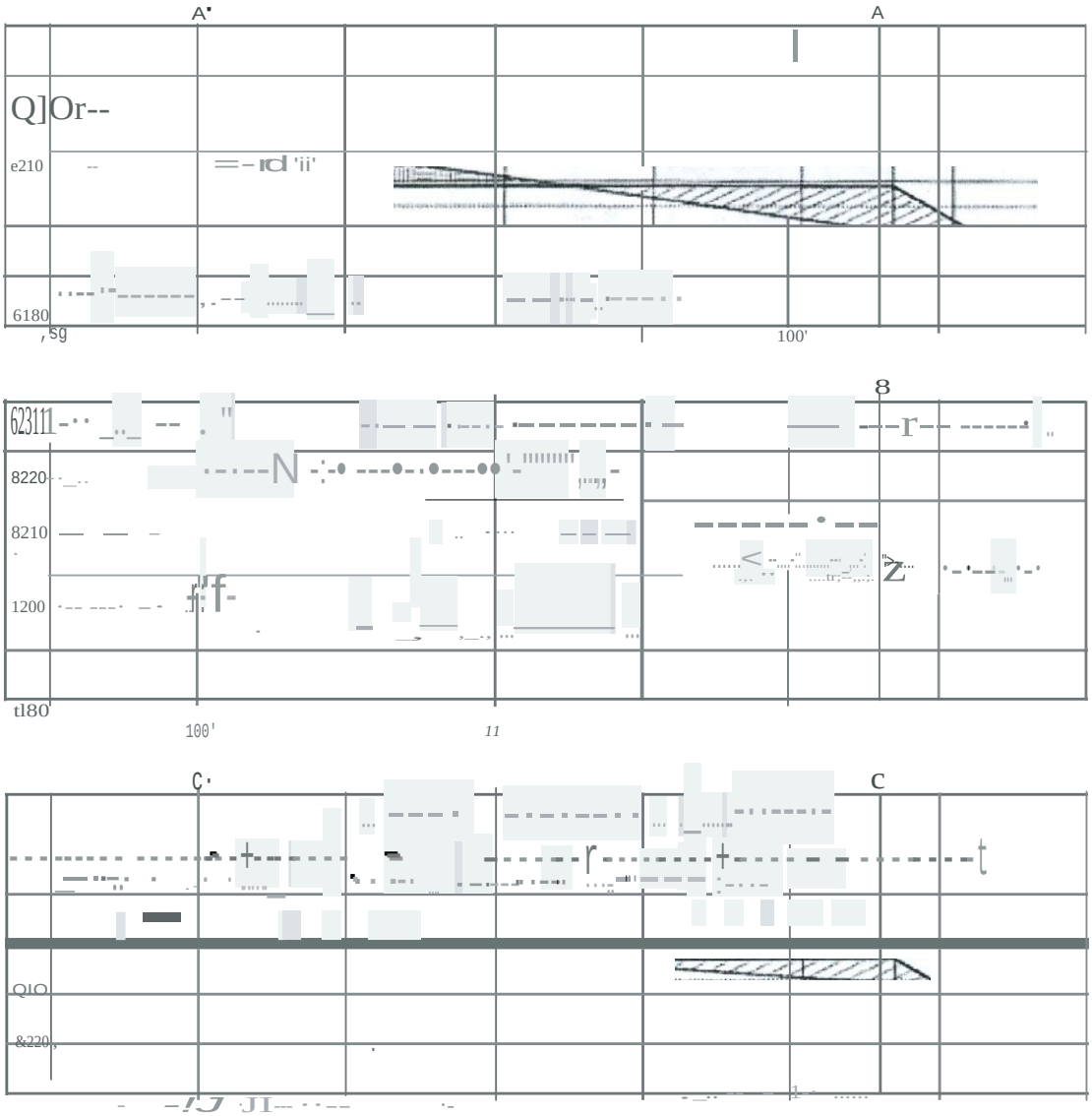
T29N, R7W, N.M.P.M.,
RIO ARRIBA COUNTY, NEW MEXICO
GROUND ELEVATION: 6209', NAVO 88
FINISHED PAD ELEVATION: 6209.0', NAVD 88



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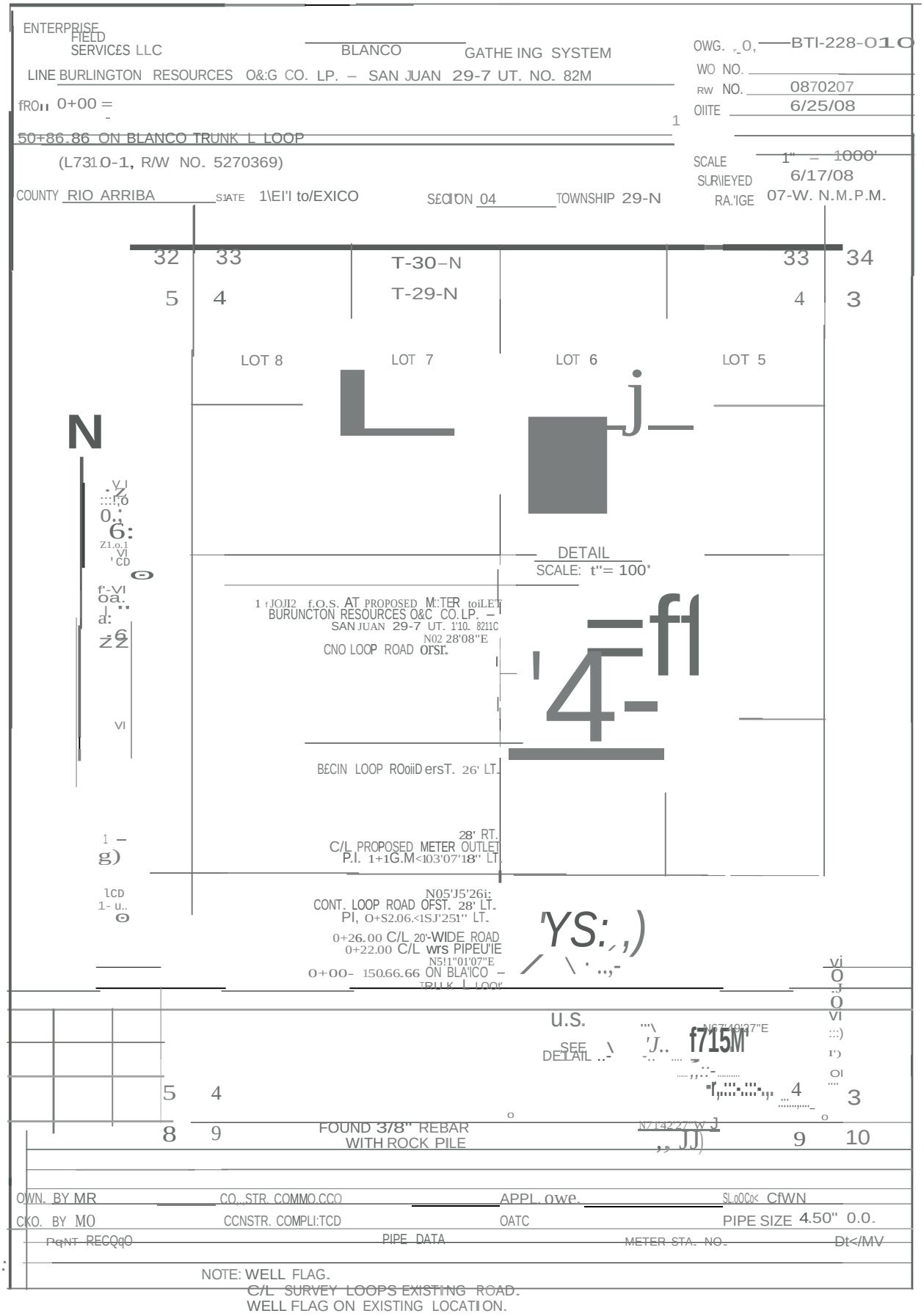
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APPENDIXC

FFO Noise NTL (04-02 FFO)

Notice to Lessees and Operators on Onshore Oil and Gas Leases Within the Jurisdiction of the Farmington Field Office (FFO) (NTL 04-2 FFO)

Management of Sound Generated By Oil and Gas Production and Transportation

I. Introduction – Increases in the level of sound (noise) generated from the production and pipeline transportation of oil and gas has occurred in the San Juan Basin over the last four years. These increases are generated primarily from the escalating need to use equipment such as compressors and pumping units, which operate on a continual basis. The increase in noise affects natural resource values and management of a number of agency designated special areas [special management areas (SMAs), areas of critical environmental concern (ACECs), research natural areas (RNAs), etc.]. Noise sensitive areas (NSAs) were determined as visitor use areas, wilderness, semi-primitive recreation areas, habitat for threatened or endangered species, raptor nesting/roosting sites, recreational trails and sites where people live and work.

II. Purpose – The Bureau of Land Management (BLM) recognizes solitude (lack of or limited sound) as a part of the natural environment that requires protection and reduction of noise in some instances. The following requirements are for reducing noise levels on federal and Indian oil and gas leases under the jurisdiction of the Farmington Field Office (FFO). The BLM will use adaptive management principles to monitor and adjust implementation of this NTL as additional data becomes available.

III. Noise Sensitive Areas – All or a portion of approximately 61specially designated areas (SDAs) established through the BLM land use planning process are being identified as noise sensitive areas (NSAs).

IV. Noise Standards – Noise will be measured on the "A" scale, using the attached protocol. The sound level (A scale) must be less than or equal to 48.6 dB(A) over a continuous 24-hour period (i.e., 48.6 dB[A]Leq). This requirement applies to oil and gas lease operations that operate on a continual (>8 hours/day), long-term basis (>1week in duration). The NTL will not apply to transient operations such as construction, drilling, completion or workover activities or temporary non-oil and gas sound sources. These activities will be handled on a case-by-case basis should a conflict be identified during the permitting process. The NTL does not apply to short-term events such as venting a well, compressor start-ups, etc.

V. Application of Standards within NSAs – Noise control will be receptor- or boundary-focused, as determined by agency management guidelines established for the designated SMAs, ACECs, or other designations. Receptor-focused control will apply to 45 BLM and 4 USFS NSAs. Receptor-focused areas may include campgrounds, picnic areas, shorelines, etc. Boundary-focused control will include all designated acreage within 7 BLM (refer to

the tables table listed below), 3 USFS, and 1 NPS NSAs, in addition to all USBR land around Navajo Reservoir.

Receptor-Focused NSAs

- Noise standards of 48.6 dB(A) Leq will be achieved at established agency receptor points within the NSAs. Established receptors are generally defined as visitor use areas, camp or picnic areas, habitat for threatened or endangerespecies, archaeological sites, and recreation trails. Receptors may vary in size from a single point source to several acres based on the features and resource components that are being managed for sound. The agency will work with the operator to establish the applicable receptor points. Buffers of 0 to 100 feet from the defined receptor may be established. The SDAs within which receptors will be designated are as follows (***notes areas where stricter standards may apply):

BLM Receptor-Focused NSAs

1.***Andrews Ranch	16. Haynes Trading Post	31. Tapacito and Split Rock
2. ***Bee Burrow	17. Holmes Group	32. ***Toh-la-kai
3. ***Bis sa'ani	18. ***Indian Creek	33. ***Twin Angels
4. BiYaazh	19. ***Jacques Chacoan Community	34. ***Upper Kin Klizhen
5. Blanco Star Panel	20. ***Kin Nizhoni	35. Alien Run
6. ***Casamero Community	21 Margarita Martinez Homestead	36. ***Angel Peak Scenic Area
7. Christmas Tree Ruin	22. Martin Apodaca Homestead	37. Glade Run
8. Church Rock Outlier	23. ***Morris 41	38. tr**Navajo Lake Horse Trail
9. ***Crow Canyon	24. Moss Trail	39. Negro Canyon
10. Delgadito-Pueblo Canyons	25. North Road (Segments 1, 2, ***6, 7)	40. Pinon Mesa
11. Dogie Canyon Schools	26. ***Pierre's Site	41. ***Simon Canyon
12. Encinada Mesa-Carrizo Canyon (Gomez Point, Gomez Canyon, Hill Road Ruin)	27. Rockhouse-Nestor Martin Homestead	42. ***Bald Eagle
13. Frances Mesa (Frances Ruin)	28. San Rafael Canyon	43. Reese Canyon
14. Gonzalez Canyon-Senon S. Vigil Homestead	29. Simon Ruin	44. River Tracts
15. Halfway House	30. Superior Mesa	45. Mexican Spotted Owl

USFS Receptor-Focused NSAs

1.***Buzzard Park Campground	3. ***Gasbuggy
2. ***Cedar Springs Campground	4. Carracas Mesa Administrative Site

Boundary-Focused NSAs

- For noise sources located inside NSAs, the standard is 48.6 dB(A) Leq at 400 feet in all directions from the noise source. For noise sources located outside of designated NSAs, the standard of 48.6 dB(A) Leq must be met at the boundaries of the NSAs. Noise sources located within 400 feet of the NSA boundary will generally be allowed to meet the standard 400 feet from the source. The SDAs that will be boundary-focused NSAs are as follows (***notes areas where stricter standards may apply):

BLM Boundary-Focused NSAs

1. ***Cho'li'i (Gobernador Knob)
2. Dzil'na'oodlii (Huerfano Mesa)

r3 FtiSsil Forest RNA
4. Carracas Mesa
5. Thomas Canyon (original acreage)
6. ***Ah-shi-sle-pah WSA
7. ***Bistij De-Na-Zin Wilderness

USFS Boundary-Focused NSAs

1. Middle Mesa Raptor Area (prior approval required)
2. Ulibarri Raptor Area (prior approval required)
3. Munoz Canyon Raptor Area (prior approval required)

PS Boundary-Focused NSA

1. ***Aztec Ruins National Monument

USBR Boundary-Focused NSA

1. All USBR land around Navajo Reservoir

Occupied Dwellings, Residences, and Buildings

- For noise sources involving federal or Indian leases located near occupied dwellings or buildings, the standard of 48.6 dB(A) Leq will be met 100 feet from such structure. Policy will not apply to unoccupied lands but can be enforced when those lands are developed. When oil and gas operations pre-date occupancy, the new resident will be asked to contribute to noise mitigation. For noise sources located within incorporated city or township limits, the standards of that municipal jurisdiction will normally be applied. However, if there isn't a municipal standard, BLM will enforce this NTL for noise sources associated with federal minerals.

Stricter Standards

- Stricter standards may be applied to NSAs identified by a triple asterisk in the tables listed above. In these instances, BLM may need the flexibility to adjust the general noise standard. BLM, USFS, USBR and NPS staffs will work with the operator on a case-by-case basis to achieve an acceptable level of noise mitigation. Factors considered in this process would be: (1) the particular aspects of the area (i.e., landscape, topography, etc.), (2) resource values and uses, (3) public values and uses and (4) the extent the 48.6 dB(A) Leq impairs values and uses.

New NSAs

- In addition to the 61areas listed in the tables, new SMAs, camping, picnic or trail areas may be identified and/or developed by land management agencies. This policy would be implemented, in and/or near these areas after a 30-day notice to the affected parties, using section VI schedules.

VI. Implementation of NTL – Upon implementation of the NTL, affected operators in or adjacent to NSAs will be provided general ownership maps depicting the NSAs. Detailed descriptions of the NSAs will be maintained and available at local administering agency offices.

With the exception of the NSAs identified by a triple asterisk in the tables, newly installed noise sources that affect NSAs (inside or adjacent to exterior boundaries) must meet the noise standard 60 days from the date the source is set in the field. All major renovation and/or replaced noise sources must meet the standard 60 days from the date the

equipment is renovated and/or replaced. A condition of approval will be included with approved Applications for Permit to Drill (APDs) requiring the operator to meet the noise standard for sources at new well locations that are permitted within or adjacent to an NSA. These standards apply to rights-of-way grants.

For existing sources of noise within defined NSAs, within 90 days of approval of the NTL, the operator shall inventory these locations and submit them to the BLM along with a proposed plan for meeting the NTL standard. The compliance plan submitted by the operator must demonstrate compliance of all applicable noise sources within 5 years, incorporating the agency time-frame compliance priority goals. All major renovation and/or replaced noise sources must meet the standard 60 days from the date the equipment is renovated and/or replaced.

VII. Procedures – A subsequent report (SR) Sundry (Form 3160.5) must be submitted to the BLM for approval by the authorized officer (AO) within 5 days of setting the equipment, which exceeds the noise standard and must be mitigated. A notification Sundry is not required for existing and new noise sources that do not exceed the 48.6 dB(A) Leq standard. A copy of the SR should be sent to the appropriate surface managing agency. Prior approval is required before setting a noise source that could affect the threatened or endangered species and raptor NSAs. The notice must include: (1) the location of the proposed noise source [township, range, section, footage or quarter/quarter (i.e., NE/4SE/4)], (2) name of the well location or facility type, (3) type of noise source (i.e., compressor, pumping unit, etc.), (4) seriousafety considerations, and (5) any other information required by the AO.

- For existing and new noise sources, the surface managing agency will initially work with the applicant to establish the applicable receptor points to which the NTL standard will apply. In addition, the BLM will work with applicants and use flexibility for mitigation of sound with boundary-focused areas.

- For new noise sources, once a receptor is permanently defined and noted on NSA maps provided by BLM to the operator, the operator must comply with the 48.6 dB(A) Leq standard and provide the BLM with noise level measurements (if needed) within the 60-day period.

  For existing noise sources, once a receptor is permanently defined and noted on NSA maps provided by BLM to the operator, the operator must comply with the noise standard according to the schedule of the 5-year plan for existing noise sources. If a new receptor has been defined in an area that has passed the schedule of the 5-year plan, the operator must comply with the noise standard and provide the BLM with noise level measurements (if needed) within 60 days of receiving a 30-day notice for newly defined receptor.

- The standard defined in Section IV or determined during the approval process must be met after the 60-day period. Measurements must be taken following the established protocol at points designated by BLM or other land management agencies.

VIII. Variances- Variances may be granted on a case-by-case basis by the AO. To obtain a variance, a Notice of Intent Sundry (NOI-Form 3160.5) or a letter must be submitted to

BtM for approval. Copies of the Sundry or letter should be sent to any appropriate surface managing agency. The sundry or letter must include the same information as an NOI.

IX. Compliance - Failure to comply with the above policy and conditions of approval may result in an assessment for noncompliance being issued pursuant to 43 Code of Federal Regulations (CFR) 3163.1by BLM staff. Any and all instructions, orders, or decisions issued are subject to administrative review pursuant to 43 CFR 3165.3 and appeal pursuant to 43 CFR 3164 and 43 CFR 4.700.

This NTL will be reviewed annually and may be modified based on monitoring and current results of implementation, a changing environment, and evolving technologies.

APPROVED: Date_____

_____
Farmington Field Manager

APPENDIXD

PHOTOGRAPHS OF PROPOSED ACTION AREA