

**ENVIRONMENTAL ASSESSMENT FOR
APRIL 2009 OIL AND GAS LEASE SALE
DOI-BLM-NM-A010-2009-006-EA**

1.0 Introduction

It is the policy of the Bureau of Land Management (BLM) as derived from various laws, including the Mineral Leasing Act of 1920 and the Federal Land Policy and Management Act of 1976, to make mineral resources available for disposal and to encourage development of mineral resources to meet national, regional, and local needs.

The BLM New Mexico State Office conducts a quarterly competitive lease sale to sell available oil and gas lease parcels in New Mexico, Oklahoma, Texas, and Kansas. A Notice of Competitive Lease Sale, which lists lease parcels to be offered at the auction, is published by the BLM State Office at least 45 days before the auction is held. Lease stipulations applicable to each parcel are specified in the Sale Notice. The decision as to which public lands and minerals are open for leasing and what leasing stipulations may be necessary, based on information available at the time, is made during the land use planning process. Surface management of non-BLM administered lands overlaying federal minerals is determined by BLM in consultation with the appropriate surface management agency or the private surface owner.

In the process of preparing a lease sale the BLM State Office sends a draft parcel list to each field office where the parcels are located. Field Office staff then review the legal descriptions of the parcels to determine if they are in areas open to leasing; if appropriate stipulations have been included; if new information has become available which might change any analysis conducted during the planning process; if appropriate consultations have been conducted, and if there are special resource conditions of which potential bidders should be made aware. Once the draft parcel review is completed and returned to the State Office, a list of available lease parcels and stipulations is made available to the public through a Notice of Competitive Lease Sale (NCLS). On rare occasions, additional information obtained after the publication of the NCLS, may result in withdrawal of certain parcels prior to the day of the lease sale.

The following Environmental Assessment (EA) documents the Albuquerque District Office review of the eleven parcels offered in the April 2009 Competitive Oil and Gas Lease Sale that are under the administration of the Albuquerque District Office. It serves to verify conformance with the approved land use plan and provides the rationale for deferring or dropping parcels from a lease sale as well as providing rationale for attaching additional lease stipulations to specific parcels.

1.1 Purpose and Need

The purpose of offering parcels for competitive oil and gas leasing is to allow private individuals or companies to explore for and develop oil and gas resources for sale on public markets.

The sale of oil and gas leases is needed to meet the growing energy needs of the United States public. New Mexico is a major source of natural gas for heating and electrical energy production in the lower 48 states, especially California. Continued leasing is necessary to maintain options for production as oil and gas companies seek new areas for production or attempt to develop previously inaccessible or uneconomical reserves.

1.2 Conformance with Applicable Land Use Plan and Other Environmental Assessments

Pursuant to 40 Code of Federal Regulations (CFR) 1508.28 and 1502.21, this environmental assessment (EA)

tiers to and incorporates by reference the information and analysis contained in the Rio Puerco Resource Management Plan, November 1986, (maintained and reprinted, 1992), the Albuquerque District Oil and Gas Plan Amendment, December 1991, the Socorro Resource Management Plan, August 1989 and the Proposed Socorro Resource Management Plan Revision, December 2008. All of the parcels to be offered are within areas open to oil and gas leasing. Site specific analysis as required by the National Environmental Policy Act (NEPA) of 1969, as amended (Public Law 91-90, 42 USC 4321 et seq.) was conducted by Rio Puerco Field Office resource specialists who relied on personal knowledge of the areas involved and/or reviewed existing databases and file information to determine if appropriate stipulations had been attached to specific parcels.

It is unknown when, where, or if future well sites or roads might be proposed. Also, at the time of this review, it is unknown whether a parcel will be sold and a lease even issued. Analysis of projected surface disturbance impacts, should a lease be developed, was estimated based on potential well densities listed in the Reasonable Foreseeable Development Scenario used as the basis for the Proposed RMP/FEIS. Detailed site specific analysis of individual wells or roads would occur when a lease holder submits an Application for Permit to Drill (APD).

The Energy Policy Act of 2005 categorically excludes certain oil and gas development activities from further NEPA analysis. However, excluded projects still must conform with the applicable RMP including any restrictions to development presented in the Plan.

The proposed project would not be in conflict with any local, county, or state plans.

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

Purchasers of oil and gas leases are required to obey all applicable federal, state, and local laws and regulations including obtaining all necessary permits required should lease development occur.

Rio Puerco Field Office Endangered Species specialists reviewed the proposed action and determined it would be in compliance with threatened and endangered species management guidelines outlined in the Biological Assessment prepared. Conference with the U.S. Fish and Wildlife Service may be required to mitigate impacts for BLM Special Status Species (Refer to the section 3.9 to more information) during APD processing.

Compliance with Section 106 responsibilities of the National Historic Preservation Act are adhered to by following the BLM – New Mexico 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 State Historic Preservation Officers, and other applicable BLM handbooks.

In accordance with BLM Instruction Memorandum NM-2004-035, a staged approach is used in the identification and evaluation of cultural properties for oil and gas leasing. Consultation with Native American tribes to identify traditional cultural properties and sacred sites takes place at the leasing stage. Identification of historic properties takes place at the APD stage of lease development. No impacts to traditional cultural properties and sacred sites have been identified. Cultural resource inventories will be undertaken and impacts to archeological sites will be assessed at the APD stage.

2.0 Alternatives Including the Proposed Action

2.1 Alternative A - No Action

The BLM NEPA Handbook (H-1790-1) states that for Environmental Assessments (EAs) on externally initiated proposed actions, the No Action Alternative generally means that the proposed action would not take place. In the case of a lease sale, this would mean that an expression of interest to lease (parcel nomination) would be denied or rejected.

The No Action alternative would withdraw all eleven lease parcels from the April 2009 lease sale. The parcels would remain available for inclusion in future lease sales. Surface management would remain the same and ongoing oil and gas development would continue on surrounding federal, private, state, and Indian leases.

No mitigation measures would be required as no new oil and gas development would occur on the un-leased lands. No rental or royalty payments would be made to the federal government.

If the BLM does not lease these Federal minerals, an assumption is that it is not expected that demand would decrease for oil and gas. Demand would likely be addressed through production elsewhere or imports. Due to less stringent environmental regulations in some areas outside of the U.S., it is possible that there would be increased emissions of volatile organic compounds (VOC), air borne dust, and GHGs during exploration and production operations. In addition, it is anticipated that there would be additional emissions of GHGs during transportation of these commodities to US ports.

It is an assumption that the No Action Alternative (no lease option) may result in a slight reduction in domestic production of oil and gas. This would likely result in reduced Federal and State royalty income, and the potential for Federal lands to be drained by wells on adjacent private or state lands. Consumption of oil and gas developed from the proposed lease parcels is expected to produce GHGs. 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. If the BLM were to forego its leasing decisions and potential development of those minerals, the assumption is that the public's demand for the resource would not change. Instead, the resource foregone would be replaced by other sources that may include a combination of imports, fuel switching, and other domestic production. This displacement of supply would offset any reductions in emissions achieved by not leasing the subject tracts.

2.2 Alternative B Proposed Action

Description of the Proposed Action

The Proposed Action would be a recommendation to the State Director that BLM offer for oil and gas leasing eleven parcels of federal minerals covering 9552.98 acres administered by the Albuquerque District Office. Standard terms and conditions as well and special stipulations listed in the applicable RMPs would apply. General location of ten of the parcels is in western Sandoval County, just east of the McKinley County line near Johnson Trading Post in Township 19 & 20 North, and Range 2, 3, & 4 West. The eleventh parcel is in western Catron County, north of U.S. Hwy. 60, Township 1 North, and Range 21 West. Parcel number, size, and detailed location of parcels are listed in Appendix 1.

Once sold, the lease purchaser has the right to use so much of the leased lands as is reasonably necessary to explore and drill for all of the oil and gas within the lease boundaries, subject to the stipulations attached to the lease (43 CFR 3101). All of the proposed parcels have been subject to prior leases. Oil and gas leases are issued for a 10-year period and continue for as long thereafter as oil or gas is produced in paying quantities. If a lease holder fails to produce oil and gas, does not make annual rental payments, does not comply with the terms and conditions of the lease, or relinquishes the lease; ownership of the minerals leased revert back to the federal government and the lease can be resold. Drilling of wells on a lease is not permitted until the lease owner or operator meets the site specific requirements specified in 43 CFR 3162.

2.3 Alternatives Considered But Not Analyzed In Detail

The original draft parcel list sent to the field office included some parcels in areas closed to leasing in the RMP. Inclusion of these parcels would not be in compliance with the land use plan, thus they were dropped from consideration. An alternative of offering all parcels with a no surface occupancy (NSO) stipulation was not analyzed in detail as those areas for which NSO was considered appropriate were analyzed in the applicable

RMPs. No other alternatives to the proposed action were apparent which would meet the purpose and need of the proposed action.

3.0 Description of Affected Environment

This section describes the environment that would be affected by implementation of the alternatives described in Section 2. Aspects of the affected environment described in this section focus on the relevant major resources or issues. Certain critical environmental components require analysis under BLM policy. Only those aspects of the affected environment that are potentially impacted are described in detail.

The proposed lease parcels are located in Sandoval and Catron Counties, New Mexico. This environmental assessment (EA) tiers to and incorporates by reference the information and analysis contained in the Rio Puerco Resource Management Plan, November 1986, (maintained and reprinted, 1992), the Albuquerque District Oil and Gas Plan Amendment, December 1991, Socorro Resource Management Plan, August 1989 and the Proposed Socorro Resource Management Plan Revision, December 2008.

In addition to the air quality information in the RMPs cited above, new information about GHGs and their effects on national and global climate conditions has emerged since the RMPs were prepared. On-going scientific research has identified the potential impacts of GHG emissions such as carbon dioxide (CO₂) methane (CH₄); nitrous oxide (N₂O); water vapor; and several trace gasses on global climate. Through complex interactions on a global scale, GHG emissions cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and burning of fossil carbon sources have caused GHG concentrations to increase measurably, and may contribute to overall climatic changes, typically referred to as global warming.

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

3.1 Air Resources

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

The Environmental Protection Agency (EPA) has the primary responsibility for regulating air quality, including seven nationally regulated ambient air pollutants. Regulation of air quality is also delegated to some states. Air quality is determined by atmospheric pollutants and chemistry, dispersion meteorology and terrain, and also includes applications of noise, smoke management, and visibility. Climate is the composite of generally prevailing weather conditions of a particular region throughout the year, averaged over a series of years.

3.1.1 Air Quality

At the present time, the counties that lie within the jurisdictional boundaries of the ADO are classified as in attainment of all state and national ambient air quality standards as defined in the Clean Air Act of 1972, as amended. Modeling conducted to date by the New Mexico Air Quality Bureau does not indicate that air quality will exceed any limits specified by the Clean Air Act in the near future.

Greenhouse gases, including carbon dioxide (CO₂) and methane (CH₄), 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 US Greenhouse Gas

Emissions and Sinks found that in 2006, total US GHG emissions were over 6 billion metric tons and that total US GHG emissions have increased by 14.1% from 1990 to 2006. The report also noted that GHG emissions fell by 1.5% from 2005 to 2006. This decrease was, in part, attributed to the increased use of natural gas and other alternatives to burning coal in electric power generation.

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 GHG's result in behavioral and industrial adaptations.

3.1.2 Climate

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

In 2001, the Intergovernmental Panel on Climate Change (IPCC) predicted that by the year 2100, global average surface temperatures would increase 1.4 to 5.8°C (2.5 to 10.4°F) above 1990 levels. 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 is more likely than increases in daily maximum temperatures. It is not, however, possible to predict with any certainty regional or site specific effects on climate relative to the proposed lease parcels and subsequent actions.

However, potential impacts to natural resources and plant and animal species due to climate change are likely to be varied, including those in the southwestern United States. For example, if global climate change results in a warmer and drier climate, increased particulate matter impacts could occur due to increased windblown dust from drier and less stable soils. Cool season plant species' spatial ranges are predicted to move north and to higher elevations, and extinction of endemic threatened/endangered plants may be accelerated. Due to loss of habitat or competition from other species whose ranges may shift northward, the population of some animal species may be reduced or increased. Less snow at lower elevations would likely impact the timing and quantity of snowmelt, which, in turn, could impact water resources and species dependant on historic water conditions. Forests at higher elevations in New Mexico, for example, have been exposed to warmer and drier conditions over a ten year period. Should the trend continue, the habitats and identified drought sensitive species in these forested areas and higher elevations may also be more affected by climate change.

In New Mexico, a recent study indicated that the mean annual temperatures have exceeded the global averages by nearly 50% since the 1970's (Enquist and Gori). 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% of the geographical area of New Mexico. Warming is greatest in the northwestern, central, and southwestern parts of the state.

3.2 Areas of Critical Environmental Concern (ACECs)

One parcel, NM-200904-138 which covers 381.68 acres is approximately ten miles southwest of the proposed Zuni Salt Lake Proprietary ACEC . This ACEC is also considered a Traditional Cultural Property, identified first in the 1989 Socorro RMP as having traditional cultural values and continued in the Socorro Proposed RMP 2008. The ten other parcels are in or adjacent to the Torreon Fossil Fauna and Jones Canyon ACEC as designated in the Rio Puerco Resource Management Plan, November 1986, (maintained and reprinted, 1992) .

3.3 Cultural Resources

In accordance with BLM Instruction Memorandum NM-2004-035, a staged approach is used in the identification and evaluation of cultural properties for oil and gas leasing. Consultation with Native American tribes to identify traditional cultural properties and sacred sites takes place at the leasing stage. Consultation was initiated November 12, 2008. Identification of historic properties takes place at the APD stage of lease development. Cultural resource inventories will be undertaken and effects to archeological sites will be assessed at the APD stage.

3.4 Native American Religious Concerns

No issues concerning traditional cultural properties and sacred sites have been identified. Input from interested tribes has been requested.

3.5 Environmental Justice

Executive Order 12898 requires federal agencies to assess projects to ensure there is no disproportionately high or adverse environmental, health, or safety effects on minority and low-income populations. Minorities comprise a large proportion of the population residing inside the boundaries of the Albuquerque District Office.

3.6 Farmlands, Prime or Unique

No prime or unique farmlands occur on the lease parcels.

3.7 Floodplains

BLM is required to meet the objectives of federal floodplain policy. Executive Order 11988 established this policy and directs agencies to “avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practical alternative.” The objectives of avoiding development and modification of floodplains are to (1) reduce the hazard and the risk of flood loss, (2) minimize the impact of floods on human safety, health, and welfare, and (3) restore and preserve the natural and beneficial floodplain values. In relation to these objectives, flood-prone areas which exist on the proposed lease parcels would be taken into consideration during the APD stage.

3.8 Wild and Scenic Rivers

No wild and scenic rivers occur on or adjacent to the lease parcels.

3.9 Invasive, Non-native Species

Currently there are no known State or County listed noxious weeds in the proposed lease sale unit. All actions on public lands that involve surface disturbance or rehabilitation, reasonable steps are required to prevent the introduction or spread of noxious weeds, including power washing or air blasting of construction equipment to remove soil and vegetative parts, requirements for using certified weed free seed, weed free hay, mulch and straw.

3.10 Threatened, Endangered Species or Special Status Species (Sensitive)

Under Section 7 of the Endangered Species Act of 1973 (as amended), the BLM is required to consult with the U.S. Fish and Wildlife Service on any proposed action which may affect federal listed threatened or endangered species or species proposed for listing. The Bureau of Land Management- Albuquerque District Office (BLM-ADO) has prepared a list of special status species to focus management efforts to mitigate potential impacts to

species and associated habitats, under a multiple use mandate. Special Status Species include those species which are:

1. Federally listed as threatened or endangered, are candidates for listing as Federally threatened or endangered, or species proposed for listing under the provisions of the Endangered Species Act (ESA);
2. Species listed by a State in a category such as threatened or endangered implying potential endangerment or extinction;
3. Those designated by each State Director as sensitive.

The authority for this policy and guidance comes from the Endangered Species Act of 1973, as amended; Title II of the Sikes Act, as amended; the Federal Land Policy and Management Act (FLPMA) of 1976; and Department of Interior Manual 235.1.1A, Departmental Manual 632.1.1-1.6, Secretarial Order 3206, and Departmental Manual 6840. Under BLM Special Status Species Management, “it is BLM’s policy to ensure that actions requiring authorization or approval by the Bureau are consistent with the conservation needs of special status species (State or Federally listed or BLM sensitive) and do not contribute to the need to list any special status species, either under provisions of the ESA or other provisions of this policy” (BLM 6840 Manual).

The lease area may contain animals or their habitats considered to be federally listed threatened and endangered species. The proposed lease parcels also contains habitat for migratory bird species, some of which may be considered Migratory Bird Species of Conservation Concern (MBSCC) and BLM special status species. Management of migratory birds and known populations of MBSCC and their associated habitats would be managed in accordance with IM No. 2008-050 to minimize adverse impacts to habitat conditions. Refer to the attached lease notices for detailed information. Mexican gray wolves, a federally listed species, have been documented to utilize the area as a travel corridor between lands administered by the U.S. Forest Service.

3.11 Wastes, Hazardous or Solid

The Resource Conservation and Recovery Act (RCRA) of 1976 established a comprehensive program for managing hazardous wastes from the time they are produced until their disposal. U.S. Environmental Protection Agency (EPA) regulations define solid wastes as any “discarded materials” subject to a number of exclusions. On July 6, 1988, EPA determined that oil and gas exploration, development and production wastes would not be regulated as hazardous wastes under RCRA. The Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980, deals with the release of hazardous substances (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. Civil and criminal penalties may be imposed if the hazardous waste is not managed in a safe manner, and according to regulations. The State of New Mexico Oil Conservation Division (NMOCD) administers hazardous waste regulations for oil and gas activities in New Mexico. No hazardous or solid waste materials are known to be present on the proposed lease parcels.

3.12 Water Quality – Surface/Ground

Sandoval and Catron Counties relies entirely on groundwater for drinking water. Ground water is also used for agricultural and industrial development. Ten of the parcels in Sandoval County are in the Rio Puerco groundwater basin and the parcel located in Catron County is in the Gallup groundwater basin.

3.13 Wetlands /Riparian Zones

No wetlands or riparian zones with permanent water are known to be present on the proposed parcels. Riparian areas in the form of scattered intermittent ponded areas or small playas with ephemeral water occur throughout the area, which are used as secondary livestock water and are used by aquatic bird species seasonally.

3.14 Soils

The following table lists the dominant soil series and selected properties for the proposed lease parcels.

Table: Dominant Soil Series

Soils Type/Texture	Typical Vegetation	Rooting Depth	Water Erosion factor (Kf)	Wind Erodibility Group	Landscape
Penistaja fine sandy loam	Grass, scattered pinyon/juniper	60"+	.28	3	Alluvial fans, uplands
Berent loamy fine sand, 0-9% slopes	Native grasses	60"+	.17	2	Uplands, mesas.
Fruitland sandy loam, 0-5% slopes	Native grasses	60"+	.28	3	Valleys, alluvial fans.
Billings silty clay loam, 0-5 % slopes	Native grasses	60"+	.37	4	Alluvial fans, valleys.
Travesilla fine sandy loam, 3-25% slopes	Native grasses	4"-8"	.24-.28	3	Uplands, cuestas.
Persayo silty clay loam, 3025% slopes	Native grasses	4"-8"	.43	4	
Hickman Clay Loam 1-5% slopes	Grass & shrubs	20"-40"	.32	6	Swales & broad drainage ways
Celacy Loam 1-10% slopes	Grass w/ trees along drainages	20"-40"	.37	5	Plains, mesa tops, alluvial fans
Gustspring Loamy sand to very gravelly sandy loam 1-10% slopes	Grass, scattered pinyon/ juniper	60"+	.17	2	Alluvial plains & fans, low areas of dissected fans
Guy Gravelly sandy loam 1-10% slopes	Grass, scattered pinyon/juniper	60"+	.24	5	Alluvial plains & fans
Jaycee Loam 1-10% slopes	Grass w/ trees along drainages	20"-40"	.37	6	Plains, mesa tops, alluvial fans
Mion Loam 1-10% slopes	Grass w/ trees along drainages	4"-20"	.32	5	Plains, mesa tops, alluvial fans

Water erosion factor Kf indicates the susceptibility of a soil to sheet and rill erosion by water. Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size. It is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, organic matter, soil structure, and saturated hydraulic conductivity, (the ease with which pores in a saturated soil transmit water). Values of Kf range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook."

3.15 Watershed – Hydrology

The parcels are in the Rio Grande and Carrizo Wash watersheds. The surface water hydrology in the area exhibits runoff mainly due to summer monsoonal rainfall, although periods of snowmelt runoff can be attributed

to snowmelt from areas of higher terrain. Due to the regional climate of generally wet winters and summers, an examination of surface water gages in the region shows that mean monthly discharges are generally the highest in July through September coinciding with the summer monsoon season and lowest in December and January after the fall dry period. Most annual maximum peak discharges and associated flooding concerns occur also in the late summer through early fall.

3.16 Mineral Resources

It is the policy of the BLM to make mineral resources available for disposal and to encourage development of these resources to meet national, regional, and local needs, consistent with national objectives of an adequate supply of minerals at reasonable prices. At the same time, the BLM strives to assure that mineral development is carried out in a manner which minimizes environmental damage and provides for the reclamation of the lands affected.

Currently there are 309 Oil and Gas Leases covering 284,675.65 acres in the area administered by the Albuquerque District Office. These leases have 590 producing, abandoned, and shut-in wells. Approximately 1770 acres or 0.006% of the leased area is disturbed. If the parcel is leased and developed through drilling, a separate environmental document would be prepared. If full field development were to occur, additional NEPA analysis addressing cumulative impacts would be required. All eleven lease parcels brought forward have been leased previously.

3.17 Livestock Grazing

All the lands in these parcels are managed by the BLM and are all leased for livestock grazing. All the allotments have year round grazing permits. The allotments have retention dams, water troughs and fences for management of livestock and distribution.

3.18 Wild Horse and Burros

District Office data indicates no wild horses or burros occur in the lease parcels.

3.19 Vegetation

The parcels are in the Great Basin Sagebrush and Montane Grassland vegetation communities, which are part of the Southern Desert Basins, Plains, and Mountain vegetation type.

3.20 Wildlife

The proposed project area provides habitat for a wide variety of wildlife species. Large ungulates in the area include pronghorn, mule deer, and elk. Large predators include cougars and an occasional black bear and Mexican gray wolf. Smaller mammals include coyotes, bobcats, gray foxes, jackrabbits, cottontail rabbits, rock squirrels, woodrats, porcupines and a variety of bats and smaller rodent species. Reptiles include bullsnakes, rattlesnakes spp., whiptail lizards, and fence lizards. Bird species in the area include golden eagles, western bluebirds, great horned owls, pinon jays, mourning doves, Gambel's quail, scaled quail, Mearns' quail, red-tailed hawks, ferruginous hawks, kestrels and a variety of migratory birds. Habitat quality is fair to good for wildlife. A wildlife habitat improvement project (wildlife water) is located within the proposed lease sale area..

3.21 Paleontology

The ten lease parcels in Sandoval County are listed as Potential Fossil Yield Class (PFYC) 5 for paleontological resources and are within or near the boundaries of the Torreon Fossil Fauna and Jones Canyon ACEC (east unit)

an area which contains significant paleontological resources. These parcels are located on the Kirtland Fruitland Formation which is classified PFYC 5.

3.22 Visual Resources

The parcels are in VRM Class IV. The area is tan-colored grassland interspersed with olive drab-colored juniper patches, covering Buff to dark sandstones and dark-grey to black basaltic features. Some features, such as mesas and cinder cones, protrude from and otherwise smooth- to medium-textured, flat to rolling landscape.

3.23 Recreation/Wilderness

These parcels are located in an area that experiences low impact dispersed use, primarily hunting. There is no designated wilderness or wilderness study areas (WSAs) within or near the proposed lease parcels.

3.24 Public Health and Safety

Leasing of the parcels analyzed in this EA would present no new or unusual health or safety issues not covered by existing state and federal laws and regulation.

3.25 Cave Karst Potential

The lease parcels offered is listed in the RMP Revision as Low Karst Potential . Cavers have not explored the area but given basalt features such as cinder cones and shield flows, there is a potential for lava tubes and other lava features, such as car- and house-sized bubbles. These in turn have potential as habitat for cave-adapted species, bat summer roosts and winter hibernacula, for cultural modification, and caving. Thus the provisions of the Federal Cave Resources Protection Act of 1988 would be in effect.

3.26 Lands and Realty

According to BLM's land records, there are approximately 19 authorized right-of-ways located within the propose leasing parcels. These ROWs consist of overhead powerlines and transmission lines, buried telephones and communication lines, and county roads.

4.0 Environmental Consequences and Proposed Mitigation Measures

No Action Alternative

Under the No Action Alternative, the proposed parcels would not be leased. There would be no new impacts from oil and gas production on the parcel lands. Oil and gas development of federal, state, private, and Indian minerals would continue on the lands surrounding the parcels. No additional natural gas or crude oil would enter the public markets and no royalties would accrue to the federal or state treasuries. The No Action Alternative would result in the continuation of the current land and resource uses on the parcels. No further analysis of the No Action alternative is presented in the following sections.

Alternative B

The act of leasing parcels would, by itself, have no impact on any resources in the Albuquerque District Office. Standard terms and conditions as well as special stipulations NM-11-LN, would apply to all lease parcels. All impacts would link to as yet undetermined future levels of lease development. The fact that all of the lease parcels have been subject to previous leases and were not developed suggests that they have low potential for extensive development. However, new technologies and economic factors could make development viable.

If lease parcels were developed, short-term impacts would be stabilized or mitigated rapidly (within 5 years) and long-term impacts are those that would substantially remain for more than 5 years.

4.1 Air Resources

4.1.1 Direct and Indirect Effects

Air Quality

Leasing the subject tracts would have no direct impacts to air quality. Any potential effects to air quality from sale of lease parcels would occur at such time that the leases were developed. Over the last 10 years, the leasing of Federal oil and gas mineral estate in Albuquerque District Office has resulted in 8 wells drilled on federal leases within this ten year period. These wells would contribute a small percentage of the total emissions (including GHG's) from oil and gas activities in New Mexico.

Potential impacts of development could include increased air borne soil particles blown from new well pads or roads, exhaust emissions from drilling equipment, compressors, vehicles, and dehydration and separation facilities, as well as potential releases of GHG and volatile organic compounds 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 for the Albuquerque District RMP Oil and Gas Amendment estimated 3 to 5 wells would be drilled annually for Federal minerals. The reasonable and foreseeable development scenario developed for the Proposed Socorro RMP Revision EIS for oil and gas development in the Planning Area would be an estimated 1.5 (22 total) wells annually for the next 15 years. An estimated two exploratory wells (10 percent of the total drilled) will lead to the discovery and production of two small economic oil and gas (or coal bed methane) fields in the next 15 years. An estimated 12 development or production wells will be drilled to delineate and exploit each oil and gas discovery field. The reasonable and foreseeable development scenario developed for the Proposed Socorro RMP Revision EIS for carbon dioxide and helium development in the Planning Area would be an estimated 10 (150 total) wells annually for the next 15 years.

Current APD permitting trends within the field office confirm that these assumptions are still accurate. This level of exploration and production would contribute a small incremental increase in overall hydrocarbon emissions, including GHGs, 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 lease tracts would not have a measurable effect on climate change.

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 EPA's inventory data breaks down the total US sources of GHG gases by major categories that include "Natural Gas Systems" and "Petroleum Systems." The inventory lists the contributions of natural gas and petroleum systems to total CO₂ and CH₄ emissions (natural gas and petroleum systems do not produce noteworthy amounts of any of the other greenhouse gases). For Natural Gas Systems, the EPA categorizes emissions from distinct stages of the larger category of natural gas systems. These stages include field production, processing, transmission and storage, and distribution. The BLM has regulatory jurisdiction only over field production. Petroleum Systems sub-activities include production field operations, crude oil transportation, and crude oil refining. Within the petroleum systems emission categories, the BLM has authority to regulate production field operations.

The BLM's regulatory jurisdiction over field production of Natural Gas Systems and production field operations of Petroleum Systems 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. The future development of the lease parcels may be subject to appropriate conditions of approval (COAs) to reduce or mitigate GHG emissions. This may occur at the project level through additional analysis. Specific measures developed at the project stage would be incorporated as COAs in the approved APD, and are binding on the operator. Typical measures may include: flare hydrocarbon and gases at high temperatures in order to reduce emissions of incomplete combustion; water dirt roads during periods of high use in order to reduce fugitive dust emissions; require that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored; and revegetate areas of the pad not required for production facilities to reduce the amount of dust from the pads.

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

4.2 Areas of Critical Environmental Concern

4.2.1 Direct and Indirect Effects

Lease parcel NM-200904-138, north of U.S. Hwy. 60, is located within 10 miles of the boundary of the proposed Zuni Salt Lake Proprietary ACEC. This ACEC is also a Traditional Cultural Property (TCP). The proposed action would be in compliance with the Proposed Socorro RMP, 2008. In the Proposed Socorro RMP the location of the lease parcel is open to oil and gas leasing, designated in the Proposed Socorro RMP Revision as Open with Controlled Surface Use Stipulations.

Sale of the remaining ten lease parcels in Sandoval County are in or near the Torreon Fossil Fauna and Jones Canyon ACEC. Lease stipulation RPRA-5 would be applied to all parcels to help identify and mitigate any paleontological resources present.

4.2.2 Potential Mitigation

Tribal Consultation has been initiated for this lease parcel sale. The Pueblo of Zuni and the Navajo Nation have been included in the consultation. Any concerns identified for the lease sale would be addressed prior to the lease sale. Potential mitigation would be applied at the APD stage and would be based on the mitigation developed in the applicable NEPA document. Best management practices would be incorporated into Conditions of Approval.

4.3 Cultural Resources

4.3.1 Direct and Indirect Effects

Direct and indirect effects can not be predicted without analysis of site specific development proposals. These proposals would occur at the APD stage of development. Potential impacts at that stage could include increased human activity and possibility of removal of, or damage to, heritage artifacts. The increase in human activity in the area increases the possibility of irretrievable loss of information pertaining to the heritage of the project region. Conversely, the benefits to heritage resources derived from the future development are the heritage and historic survey that adds to literature, information, and knowledge of cultural resources.

4.3.2 Potential Mitigation

Specific mitigation measures, including, but not limited to, possible site avoidance or excavation and data recording would have to be determined when site specific development proposals are received. Attach lease notice NM-11-LN and lease stipulation S-CSU-C1 to lease parcels.

4.4 Native American Religious Concerns

4.4.1 Direct and Indirect Effects

No direct or indirect effects are predicted based on existing information. Use of lease notice NM-11-LN and lease stipulation S-CSU-C1 would help ensure that new information is incorporated into lease development. Additional consultation may be initiated at the APD stage of development if BLM professional staff determines it is necessary.

4.4.2 Potential Mitigation

Attach lease notice NM-11-LN and lease stipulation S-CSU-C1 to lease parcel NM-200904-138. No other mitigation required at this stage.

4.5 Environmental Justice

4.5.1 Direct and Indirect Effects

No minority or low income populations would be directly affected in the vicinity of the proposed action. Indirect effects could include effects due to overall employment opportunities related to the oil and gas and service support industry in the region as well as the economic benefits to state and county governments related to royalty payments and severance taxes. Other effects could include a small increase in activity and noise disturbance in areas used for grazing, wood gathering, or hunting. However, these effects would apply to all public land users in the project area.

4.5.2 Potential Mitigation

None required.

4.6 Farmlands, Prime or Unique

4.6.1 Direct and Indirect Effects

There are no prime farmlands in the project area.

4.6.2 Potential Mitigation

None required.

4.7 Floodplains

BLM is required to meet the objectives of federal floodplain policy. Executive Order 11988 established this policy and directs agencies to “avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practical alternative.” The objectives of avoiding development and modification of floodplains are to (1) reduce the hazard and the risk of flood loss, (2) minimize the impact of floods on human safety, health, and welfare, and (3) restore and preserve the natural and beneficial floodplain values. In relation to these objectives, flood-prone areas which exist on the proposed lease parcels would be taken into consideration during the APD stage.

4.7.1 Direct and Indirect Effects

Potential impacts may include alteration of natural floodplain areas by surface disturbance or placement of oil and gas facilities. New access roads may be constructed which cross floodplains.

4.7.2 Potential Mitigation

Specific mitigation measures would be deferred until APD stage. Generally, flood prone areas would be avoided in the placement of oil and gas infrastructure. Any new access roads crossing floodplains would be designed to minimize impact to natural floodplain functions.

4.8 Wild and Scenic Rivers

4.8.1 Direct and Indirect Effects

No direct or indirect effects will occur.

4.8.2 Potential Mitigation Measures

None Required.

4.9 Invasive, Non-native Species

4.9.1 Direct and Indirect Effects

Any surface disturbance can increase the possibility of establishment of new populations of invasive non-native species. The likelihood of this happening can not be predicted with existing information. Minimizing the potential for introduction of weeds into developed site is a primary objective. Power washing or air blasting construction equipment and using weed free seed and weed free vegetative reclamation products has proven effective in protecting sites from weed introduction. At the APD stage, BLM requirements for use of weed control strategies would minimize the potential for spread of these species.

4.9.2 Potential Mitigation

Construction equipment will be power washed or air blasted to remove soils and vegetative materials on the equipment prior to entering the project sites. Certified noxious weed free seed will be used in any reclamation

area. Weed free mulches will be utilized. Specific site plans will be developed at APD stage. Best management practices would be incorporated into Conditions of Approval.

4.10 Threatened, Endangered Species, or Special Status Species (Sensitive)

4.10.1 Direct and Indirect Effects

The proposed lease sale parcels are located within areas, which provide habitat for a multitude of special status species (SSS), raptors, prairie dog, and migratory bird species (some of which may be considered Migratory Bird Species of Conservation Concern (MBSCC), which may be adversely impacted by the proposed action. Impacts associated with the sale of the proposed leases may result in further habitat degradation and fragmentation, which may force a decreased use of or completed abandonment of otherwise suitable habitat. Based on existing available information leasing of the parcels may have adverse effects on listed and /or special status species. Site specific biological resource surveys would be required at the APD stage and, depending on location and nature of the proposed development and results of surveys, additional Section 7 consultation could be required.

Actions associated with the proposed lease sale may cause habitat fragmentation in areas of habitat that may support the Mexican gray wolf, which may result in adverse impacts on the species. However, actions associated with the proposed lease sale would not jeopardize the continued existence of the species. Therefore the effect determination of May Affect, Not Likely to Adversely Affect is the appropriate effect determination for the Mexican gray wolf and the BLM is not required to consult with the FWS on this determination, but instead confer.

Authorized activities such as rights-of-ways could fragment habitat however no single activity or combination of activities in the future authorized by the Socorro Field Office is likely to jeopardize the continued existence of Mexican gray wolves. On January 12, 1998, the FWS published an Endangered Species Act (ESA) section 10(j) rule on the Mexican gray wolf that provided for the designation of specific populations of listed species in the United States as “an experimental populations”. Species that are designated a nonessential experimental population under Section 10(j) of the ESA are considered a “proposed” species for BLM for purposes of compliance with Section 7 of the Act. Under section 7 of the ESA, Federal agencies are under obligation to confer with the FWS, as opposed to consult, on their proposed actions that are likely to jeopardize the continued existence of the species. However, BLM policy (Manual 6840.06B) states that the BLM shall confer with the FWS on any action that is likely to adversely affect a proposed species or proposed critical habitat.

4.10.2 Potential Mitigation

Although impacts to wildlife resources can not be fully analyzed at this point, the following lease notices and stipulation would be attached to the lease, the Washington Office: Threatened and Endangered Species Stipulation (included within Instruction Memorandum No. 2002-174), Migratory Bird Species-Interim Management Guidance Policy (included within Instruction Memorandum No. 2008-050), LEASE NOTICE: BLM SENSITIVE SPECIES, LEASE NOTICE: RAPTORS, MIGRATORY BIRDS, AND PRAIRIE DOG SURVEYS, LEASE NOTICE: BIOLOGICAL SURVEY, and lease stipulation to the lease-Protection of Raptor and Prairie Dog Habitat to reduce impacts to raptor and prairie dog habitat shall be attached to the lease for purposes of mitigating anticipated impacts to the wildlife resource. These lease notices provide more detailed information concerning limitations that already exist in law, lease terms, regulations, or operational orders. The lease notices also address special items the lessee should consider when planning operations, such as the completion of a Special Status Species/Raptor/Migratory Bird Survey, but does not impose new or additional restrictions.

There are no known existing special status plant species (Endangered, Threatened, or Sensitive) within these lease parcels and no known potential habitat for special status plant species. During the more detailed analysis for an APD, (Environmental Analysis), biological surveys may find a previously undocumented special status

plant population. Current status on endemic or sensitive plants may change through time, elevating concerns for them, and their listing with the USFWS. See section above for management of (Endangered, Threatened, or Sensitive) species, applies to plants as well as wildlife. The Washington Office Threatened and Endangered Species Stipulation (included within Instruction Memorandum No. 2002-174), and Lease Notice for BLM Sensitive Species, and Lease Notice for Biological Survey would be attached to the lease.

4.11 Wastes, Hazardous or Solid

The lease parcels fall under environmental regulations that impact exploration and production waste management and disposal practices and impose responsibility and liability for protection of human health and the environment from harmful waste management practices or discharges.

4.11.1 Direct and Indirect Effects

The direct impact would follow a lease sale project when solid waste is discarded and contaminates the land surface either by solid, semi-solid, liquid, or contained gaseous material. The indirect impact is the Environmental Protection Agency (EPA) definition of solid wastes that have been designated as exempt and nonexempt and if it is hazardous, civil and criminal penalties may be imposed if the waste is not managed in a safe manner, and according to regulations.

4.11.2 Potential Mitigation

The lease sale parcels are regulated under the Resource Conservation and Recovery Act (RCRA) Subtitle C regulations which are extremely stringent. As well as, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) that provides for the exclusion of petroleum, including crude oil or any fraction thereof from the definition of hazardous substance, pollutant, or contaminant. The mitigation would include the stringent regulation of waste containment within the project areas.

4.12 Water Quality: Surface and Groundwater

Potential effects would depend on site specific location of future development and cannot be predicted or quantified at the leasing stage. General conditions of approval at the APD stage will constitute Best Management Practices and include reclamation of plant communities and use of erosion control measures, water control measures, and sedimentation control measures, such as road and pad location and design, culverts, and silt traps to reduce erosion and sediment flow. Existing regulations require operators ensure an adequate casing program is designed to protect ground water from contamination.

4.12.1 Direct and Indirect Effects

While the act of leasing a parcel would produce no impacts, subsequent development of the lease would lead to surface disturbance from the construction of well pads, access roads, pipelines, and powerlines can result in degradation of surface water quality and groundwater quality from non-point source pollution, increased soil losses, and increased gully erosion.

Potential direct impacts that would occur due to construction of well pads, access roads, pipelines, and powerlines include increased surface water runoff and off-site sedimentation brought about by soil disturbance: increased salt loading and water quality impairment of surface waters; channel morphology changes due to road and pipeline crossings; and possible contamination of surface waters by produced water. The magnitude of these impacts to water resources would depend on the proximity of the disturbance to the drainage channel, slope aspect and gradient, degree and area of soil disturbance, soil character, duration and time within which construction activity would occur, and the timely implementation and success or failure of mitigation measures.

Direct impacts would likely be greatest shortly after the start of construction activities and would likely decrease in time due to natural stabilization, and reclamation efforts. Construction activities would occur over a relatively short period; therefore, the majority of the disturbance would be intense but short lived. Direct impacts to surface water quality would be minor, short-term impacts which may occur during storm flow events. Indirect impacts to water-quality related resources, such as fisheries, would not occur.

Petroleum products and other chemicals, accidentally spilled, could result in surface and groundwater contamination. Similarly, possible leaks from reserve and evaporation pits could degrade surface and ground water quality. Authorization of the proposed projects would require full compliance with BLM directives and stipulations that relate to surface and groundwater protection.

4.12.2 Potential Mitigation

The use of a plastic-lined reserve pits would reduce or eliminate seepage of drilling fluid into the soil and eventually reaching groundwater. Spills or produced fluids (e.g., saltwater, oil, and/or condensate in the event of a breach, overflow, or spill from storage tanks) could result in contamination of the soils onsite, or offsite, and may potentially impact surface and groundwater resources in the long term. The casing and cementing requirements imposed on proposed wells would reduce or eliminate the potential for groundwater contamination from drilling muds and other surface sources.

4.13 Wetlands/Riparian Zones

4.13.1 Direct and Indirect Effects

The proposed lease sale does contain several ephemeral riparian areas/riparian habitat in the form of playas that hold water seasonally. Impacts associated with the sale of the proposed leases may result in habitat degradation and fragmentation and degradation of riparian habitat, which may force a decreased use of or complete abandonment of otherwise suitable habitat and/or loss of riparian values. Based on existing available information leasing of the parcels will not have an adverse affects on riparian habitat, but the amount and location of direct and indirect effects can not be predicted until the site specific APD stage of development.

4.13.2 Potential Mitigation

None required.

4.14 Soils

The amount and location of direct and indirect effects cannot be predicted until the site specific APD stage of development. Soils rate from poor to good for use as roadfill. Loss of fines due to soil erosion by wind and/or water increases deterioration of road surfaces. Increased traffic in the area with development would cause increased deterioration that could make travel by the allotment permittees difficult. Road design to BLM standards and use of suitable fill will decrease erosion effects.

4.14.1 Direct and Indirect Effects

While the act of leasing a tract would produce no impacts, subsequent development of the lease would physically disturb the topsoil and would expose the substratum soil on subsequent project areas. Direct impacts resulting from the oil and gas construction of well pads, access roads, and reserve pits include removal of vegetation, exposure of the soil, mixing of horizons, compaction, loss of top soil productivity and susceptibility to wind and water erosion. Wind erosion would be expected to be a minor contributor to soil erosion with the possible exception of dust from vehicle traffic. These impacts could result in increased indirect impacts such as

runoff, erosion and off-site sedimentation. Activities that could cause these types of indirect impacts include construction and operation of well sites, access roads, gas pipelines and facilities.

Contamination of soil from drilling and production wastes mixed into soil or spilled on the soil surfaces could cause a long-term reduction in site productivity. Some of these direct impacts can be reduced or avoided through proper design, construction and maintenance and implementation of best management practices.

Additional soil impacts associated with lease development would occur when heavy precipitation causes water erosion damage. When water saturated segment(s) on the access road become impassable, vehicles may still be driven over the road. Consequently, deep tire ruts would develop. Where impassable segments are created from deep rutting, unauthorized driving may occur outside the designated route of access roads.

4.14.2 Potential Mitigation

The operator would stockpile the topsoil from the surface of well pads which would be used for surface reclamation of the well pads. The impact to the soil would be remedied upon reclamation of well pads when the stockpiled soil that was specifically conserved to establish a seed bed is spread over well pads and vegetation re-establishes.

Reserve pits would be recontoured and reseeded as described in attached Conditions of Approval. Upon abandonment of wells and/or when access roads are no longer in service the Authorized Officer would issue instructions and/or orders for surface reclamation/restoration of the disturbed areas as described in attached Conditions of Approval.

Road construction requirements and regular maintenance would alleviate potential impacts to access roads from water erosion damage.

For the purpose of protecting slopes or fragile soils surface disturbance will not be allowed on slopes over 30 percent.

4.15 Watershed - Hydrology

4.15.1 Direct and Indirect Effects

While the act of leasing a parcel would produce no impacts, subsequent development of the lease would result in long term and short term alterations to the hydrologic regime. Peak flow and low flow of perennial streams, ephemeral, and intermittent rivers and streams would be directly affected by an increase in impervious surfaces resulting from the construction of the well pad and road. The potential hydrologic effects to peak flow is reduced infiltration where surface flows can move more quickly to perennial or ephemeral rivers and streams, causing peak flow to occur earlier and to be larger. Increased magnitude and volume of peak flow can cause bank erosion, channel widening, downward incision, and disconnection from the floodplain. The potential hydrologic effects to low flow is reduced surface storage and groundwater recharge, resulting in reduced baseflow to perennial, ephemeral, and intermittent rivers and streams. The direct impact would be that hydrologic processes may be altered where the perennial, ephemeral, and intermittent river and stream system responds by changing physical parameters, such as channel configuration. These changes may in turn impact chemical parameters and ultimately the aquatic ecosystem.

Long term direct and indirect impacts to the watershed and hydrology would continue for the life of wells and would decrease once all well pads and road surfacing material has been removed and reclamation of well pads, access roads, pipelines, and powerlines has taken place. Short term direct and indirect impacts to the watershed and hydrology from access roads that are not surfaced with material would occur and would likely decrease in time due to reclamation efforts.

4.15.2 Potential Mitigation

The operator would stockpile the topsoil from the surface of well pads which would be used for surface reclamation of the well pads. Reserve pits would be recontoured and reseeded as described in attached Conditions of Approval. Upon abandonment of the wells and/or when access roads are no longer in service the Authorized Officer would issue instructions and/or orders for surface reclamation/restoration of the disturbed areas as described in the attached Conditions of Approval.

4.16 Mineral Resources

4.16.1 Direct and Indirect Effects

The amount and location of direct and indirect effects can not be predicted until the site specific APD stage of development. The lease parcels do not appear to present any conflict with the development of other mineral resources such as coal or sand and gravel.

4.16.2 Potential Mitigation

Deferred to the site specific APD stage of development.

4.17 Livestock Grazing

4.17.1 Direct and Indirect Effects

The amount and location of direct and indirect effects can not be predicted until the site specific APD stage of development. Rangeland improvements can be impacted by road and pad development. In this area there are a number of retention dams and water troughs. In addition there are playas that have seasonal water, that are secondary livestock water areas. Placement of facilities close to water can increase potential for contamination of the water site during construction and operations. In addition closeness to water can increase potential on stock using the pad areas for resting, and rubbing.

4.17.2 Potential Mitigation

At the site specific APD stage of development, watering facilities, playas and improvements will be avoided, and roads and pads planned to prevent sediment loads and contaminates. Cattle guards will be installed on fence lines. BLM currently consults with grazing permittees on a site by site basis as part of the Approved Plan to Drill process. Best management practices would be incorporated into Conditions of Approval.

4.18 Wild Horse and Burros

4.18.1 Direct and Indirect Effects

No effects would occur.

4.18.2 Potential Mitigation

None required.

4.19 Vegetation

4.19.1 Direct and Indirect Effects

The amount and location of direct and indirect effects can not be predicted until the site specific APD stage of development.

4.19.2 Potential Mitigation

Deferred to the site specific APD stage of development. Best management practices would be incorporated into Conditions of Approval.

4.20 Wildlife

4.20.1 Direct and Indirect Effects

Direct and indirect effects on specific wildlife species can not be determined until site specific project proposals are analyzed at the APD stage of development.

4.20.2 Potential Mitigation

Attach the lease stipulations to the lease-Protection of Raptor and Prairie Dog Habitat to reduce impacts to raptor and prairie dog habitat. Also attach the following lease notices: Migratory Bird Species-Interim Management Guidance Policy (included within Instruction Memorandum No. 2008-050), LEASE NOTICE: BLM SENSITIVE SPECIES, LEASE NOTICE: RAPTORS, MIGRATORY BIRDS, AND PRAIRIE DOG SURVEYS, and LEASE NOTICE: BIOLOGICAL SURVEY, shall be attached to the lease for purposes of mitigating anticipated impacts to the wildlife resource. These lease notices provide more detailed information concerning limitations that already exist in law, lease terms, regulations, or operational orders

4.21 Paleontology

4.21.1 Direct and Indirect Effects

The amount and location of direct and indirect effects can not be predicted until the site specific APD stage of development. Parcels are located on PFYC 5, paleontological resources will be considered at the APD stage and a controlled use stipulation (RPRA-5) will be attached to the offered parcels. This stipulation will allow for identification of paleontological resources at the development stage.

4.21.2 Potential Mitigation

Deferred to the site specific APD stage of development. Best management practices would be incorporated into Conditions of Approval and stipulation would be attached to the lease.

4.22 Visual Resources

Visual resource management is broken into four VRM classes. In the tract proposed for leasing only VRM class IV is represented.

4.22.1 Direct and Indirect Effects

The VRM Class IV objective is to provide for management activities which require major modification of the existing landscape character. Every attempt, however, should be made to reduce or eliminate activity impacts through careful location, minimal disturbance, and repeating the basic landscape elements. Facilities, such as condensate and produced water or oil storage tanks that rise above eight feet, would provide a geometrically strong vertical and horizontal visual contrast in form and line to the characteristic landscape and vegetation,

which have flat, horizontal to slightly rolling form and line. The construction of an access road, well pad and other ancillary facilities would slightly modify the existing area visual resources. Through color manipulation, by painting well facilities to blend with the rolling to flat vegetative and/or landform setting with a with a color determined by the authorized officer at the time of development,. The view is expected to favorably blend with the form, line, color and texture of the existing landscape.

4.22.2 Potential Mitigation

For VRM IV all facilities, including the meter building, would be painted a color determined by the authorized officer at the time of development to blend with the rolling to flat vegetative and/or landform setting. Cumulative adverse visual impacts can be avoided by gradually moving into a more appropriate vegetative/landform setting color scheme.

4.23 Recreation/Wilderness

4.23.1 Direct and Indirect Effects

Potential effects could occur on dispersed recreation activities such as big game hunting in small areas but these effects can not be determined until site specific development proposals are received at the APD stage. No effects on wilderness or wilderness study areas.

4.23.2 Potential Mitigation

Deferred to site specific requirements determined at the APD stage.

4.24 Public Health and Safety

4.24.1 Direct and Indirect Effects

Specific potential effects can not be determined until site specific development proposals are received at the APD stage. Based on the history of oil and gas development, overall effects of leasing less than one-half percent of the lands open to oil and gas development should result in negligible direct and indirect effects.

4.24.2 Potential Mitigation

Deferred to site specific requirements determined at the APD stage.

4.25 Cave Karst Potential

4.25.1 Direct and Indirect Effects

Deferred to site specific requirements determined at the APD stage.

4.25.2 Potential Mitigation

There is potential of lava tubes or other cave-like lava features (large bubbles) due to the volcanic features in the lease parcel area. Attach lease stipulation Potential Cave or Karst Occurrence Area to the lease NM-200904-138.

4.26 Lands and Realty

The level and location of direct and indirect effects can not be predicted until the site specific APD stage of development. Existing ROW's can be impacted by road and pad development. To avoid impacts to existing uses, BLM would contact the ROW holders and notify them of the site specific APD stage of development. As a result of the discussion the propose site specific APD location and materials used for pads may be adjusted to minimize the effects.

4.27 Cumulative Effects

This environmental assessment (EA) tiers to and incorporates by reference the information and analysis contained in the Resource Management Plans. The RMPs designated federal minerals open for continued oil and gas development and leasing under Standard Terms and Conditions and described specific stipulations that would be attached to new leases offered in certain areas. All of the parcels to be offered in the April 2009 sale are within areas open to oil and gas leasing, designated as Open with Controlled Surface Use Stipulations.

Currently there are 309 Oil and Gas Leases covering 284,675.65 acres in the ADO. These leases have 590 producing, abandoned, shut-in wells. Approximately 1770 acres or 0.006% of the leased area is disturbed. If the proposed parcels listed are leased and developed through drilling, a separate environmental document would be prepared. If full field development were to occur, additional NEPA analysis addressing cumulative impacts would be required. Impacts from this development will remain on the landscape until final abandonment and reclamation of facilities occurs at some unknown time in the future. Ongoing mitigation and reclamation procedures will continue to be used to limit effects.

It is unknown when, where or if future well sites or roads might be proposed within the proposed lease sale areas. Also, at the time of this review, it is unknown whether a parcel will be sold and a lease even issued. Analysis of projected surface disturbance impacts, should a lease be developed, was estimated based on potential well densities listed in the Reasonable Foreseeable Development Scenario used as the basis for the RMP/FEIS. Detailed site specific analysis of individual wells or roads would occur when a lease holder submits an Application for Permit to Drill (APD).

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 making the proposed tracts available for leasing. Some general assumptions however can be made: leasing the proposed tracts may contribute to drilling new wells. (Refer to limitations of projecting actual number of wells as a result of the proposed action under direct/indirect effects.)

The New Mexico Greenhouse Gas Inventory and Reference Case Projection 1990-2020 (Inventory) estimates that approximately 19.3 million metric tons of both CO₂ and CH₄ emissions were produced in 2000 by oil and natural gas production, processing, transmission and distribution. Of the 19.3 million metric tons, approximately 17 million metric tons may be attributed to natural gas activities and 2.3 million metric tons can be attributed to oil production. As of 2002, the Inventory indicates that there approximately 21,771 oil wells and 23,261 gas wells in the State.

On the average, approximately one wildcat oil and gas exploration well has been drilled per year since 1920; approximately half of the wells were located on Federal minerals. Drilling intensity has ranged from only two wells in 10 years during the depression in the 1930's to 16 wells in 10 years during the oil embargo of the 1970's. Over the last 10 years, the leasing of Federal oil and gas mineral estate has resulted in an average total of 6 wells drilled on federal leases, both for CO₂ gas. These wells would contribute a small percentage of the total emissions (including GHG's) from oil and gas activities in New Mexico. The low past and current level of development is an indicator of the level of activity in the ADO.

This average number of gas wells drilled annually in the ADO and probable GHG emission levels, when compared to the total GHG emission estimates from the total number of oil and gas wells in the State, represent a small, incremental contribution to the total regional and global GHG emission levels. This small incremental

contribution to global GHG gases cannot be translated into incremental effects on climate change globally or in the area of these site-specific actions. As oil and gas and natural gas production technology continues to improve in the future, one assumption is that it may be feasible to further reduce GHG emissions.

Regarding the linkage between climate changes related warming and associated impacts, an assessment of the IPCC states that difficulties remain in attributing observed temperature changes at smaller than continental scales. Therefore, it is currently beyond the scope of existing science to predict climate change on regional or local scales resulting from specific sources of GHG emissions.

There has been no change in the basic assumptions or projections described in the PRMP/FEIS analysis except in regard to air quality. Additional monitoring and modeling conducted by the State of New Mexico Air Quality Bureau since completion of the PRMP/FEIS indicate that projected development is unlikely to elevate ozone concentrations to significant levels for the foreseeable future (see New Mexico Environment Department website for more details - <http://www.nmenv.state.nm.us/aqb/ozonetf/SanJuanEAC.update.3.17.04.ppt>).

5.0 Description of Mitigating Measures and Residual Impacts

The lease sale will be mitigated by attaching the Oil and Gas Leasing Stipulation(s) to the lease parcel(s). The Albuquerque District Office’s, Surface Use and Occupancy Requirements, Conditions of Approval, and the Albuquerque District Office’s Special Leasing Stipulations, which are in place at the New Mexico State Office, will provide adequate mitigation for all lease parcels.

Direct, indirect, cumulative and residual impacts of leasing and lease development are generally described in the approved Resource Management Plans and Record of Decisions. An environmental analysis will be prepared on a case-by-case basis upon receipt of future subsequent actions.

6.0 Consultation/Coordination

This section lists individual resource specialists located within the Field office or District as well as other individuals/agencies who were contacted during the development of this document.

Table 6.1 Summary of Contacts Made During Preparation of Document and Interdisciplinary Team

Persons/Agencies Consulted:

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

Contact	Title	Organization	Present at Onsite?
Mr. Marklynn Chee	Navajo Culture Specialist	The Navajo Nation	No
Joe L. Cayaditto, Jr.	President	Torreón Navajo Chapter	No
Jeanette Vice	President	Ojo Encino Chapter	No
Norman Coeeyate	Governor	Pueblo of Zuni	No
Dr. Jonathon Damp	Culture Specialist	Pueblo of Zuni	No

EA Preparers:

David Sitzler, Assistant Field Manager, Rio Puerco Field Office
Sheila L. Williams, Natural Resource Specialist, Socorro Field Office

7.0 References

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6.2 Authorities

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40 CFR All Parts and Sections inclusive *Protection of Environment*, Revised as of July 1, 2001.

43 CFR, All Parts and Sections inclusive - *Public Lands: Interior*. Revised as of October 1, 2000.

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APPENDIX 1: ALBUQUERQUE DISTRICT OFFICE

NM-200904-100 640.000 Acres
T.0200N, R.0020W, NM PM, NM
Sec. 014 ALL;
Sandoval County

NM-200904-101 640.000 Acres
T.0200N, R.0020W, NM PM, NM
Sec. 019 S2;
Sandoval County

NM-200904-102 640.000 Acres
T.0200N, R.0030W, NM PM, NM
Sec. 028 ALL;
Sandoval County

NM-200904-103 603.040 Acres
T.0190N, R.0040W, NM PM, NM
Sec. 005 LOTS 1-4;
005 S2N2,S2;
Sandoval County

NM-200904-104 1120.000 Acres
T.0190N, R.0040W, NM PM, NM
Sec. 011 ALL;
012 W2,SE;
Sandoval County

NM-200904-105 1080.000 Acres
T.0190N, R.0040W, NM PM, NM
Sec. 016 NE;
017 N2,W2SW,SESW,SE;
018 E2;
Sandoval County

NM-200904-106 1888.260 Acres
T.0200N, R.0040W, NM PM, NM
Sec. 004 LOTS 1-4;
004 S2N2,S2;
005 LOTS 1-4;
005 S2N2,S2;
009 NE,W2;
010 S2NE,NW;
Sandoval County

NM-200904-107 1120.000 Acres
T.0200N, R.0040W, NM PM, NM
Sec. 023 ALL;

024 N2,SW;
Sandoval County

NM-200904-108 160.000 Acres
T.0200N, R.0040W, NM PM, NM
Sec. 024 SE;
Sandoval County

NM-200904-109 1280.000 Acres
T.0200N, R.0040W, NM PM, NM
Sec. 027 ALL;
034 ALL;
Sandoval County

NM-200904-138 381.68 acres
T. 1 N., R. 21 W., NMPM, NM
Sec. 28: Lots 1-4, NE;
Sec. 34: W2W2.
Catron County