Department of the Interior
Bureau of Land Management
Roswell Field Office

Project:
July 2008 Competitive Oil and Gas Lease Sale EA Log Number: NM-510-2008-101
Location:
Various Locations in Chaves, Quay, Guadalupe, and Roosevelt Counties, New Mexico.

Finding of No Significant Impact

Impact identification and analysis of approving the project proposal and alternative has been completed. Environmental analysis has been conducted based on available inventory and monitoring data files. An environmental assessment has been prepared and revised as necessary. The proposed action conforms with and is within the scope of the land use decisions described in the 1997 Roswell Approved Resource Management Plan and the 2008 Special Status Species Resource Management Plan Amendment. Implementation of required stipulations and/or mitigating measures, will maintain impacts within those levels analyzed in the PRMP/FEIS. Based on the analysis of potential environmental impacts contained in the attached environmental assessment, I have determined that impacts are not expected to be significant and an environmental impact statement is not required.

Decision Record

Decision:

It is my decision to recommend that the New Mexico State Office of the Bureau of Land Management offer for competitive sale four (4) of the twelve (12) parcels of federal minerals originally listed in the July Draft Sale Parcel List with the addition of further stipulations and lease notices to certain parcels. See Appendix 1, Table 1.

NM-200807-011
NM-200807-012
NM-200807-013
NM-200807-042

Rationale:

The parcels described in Appendix 1, Table 1 of the EA were reviewed by an interdisciplinary group of specialists at the Roswell Field Office. The purpose of the review was to determine if the parcels were in areas open to oil and gas leasing; if leasing was in conformance with the existing land use plans; if new information had been developed which might affect leasing suitability; to ensure that appropriate lease stipulations were attached to each lease parcel; and to verify that appropriate consultations had been conducted.

BLM inventory and monitoring data files and the professional opinion of BLM endangered species specialists is that no federally listed threatened, endangered, or proposed species would be adversely affected by sale of the lease parcels. Effects of oil and gas leasing and development on threatened or endangered species were analyzed in Section 7 consultation (Cons. # 2-22-96-F-102, Cons. #22420-2006-I-0144, and Cons. #22420-2007-TA-0033). No new information has been uncovered which would change that analysis. . Additional review and analysis would occur when site specific proposals for development are received.

New information regarding greenhouse gas emissions and climate change has been developed since the RMP. This information has been incorporated into **EA NM-510-2008-101.** Analysis determined that leasing the subject tracts could lead to eventual development which would result in small incremental increases in GHG emissions. These emissions will be minimized by special conditions of approval developed for specific development proposals.

Mitigating measures and/or stipulations were considered and analyzed in the environmental assessment. Appropriate lease stipulations and lease notices will be attached to individual parcels as listed in Appendix 1, Table 1 of the EA.

Administrative Review and Appeal:

Under BLM regulations, an offer to lease for oil and gas is subject to protest in accordance with 43 CFR 3101. Any request for administrative review of the later issuance of an oil and gas lease must be filed with the Interior Board of Land Appeals in accordance with 43 CFR part 4.

Prepared by:

/s/Angel Mayes 7/10/08
_____Date_____
Assistant Field Manager
Lands and Minerals

Approved by:

/s/Eddie Bateson 7/10/08
_____Date_____
Roswell Field Office Manager

BUREAU OF LAND MANAGEMENT-ROSWELL FIELD OFFICE
ENVIRONMENTAL ASSESSMENT # NM-510-08-101 FOR July 2008 LEASE SALE

Resources	**Analyzed Lease Parcels**	**BLM Reviewer**	**Date**
CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT			
Air Quality	X	Hydrologist /s/ Michael McGee	4/9/08
Floodplains	X		
Water Quality - Surface	X		
Water Quality - Ground	X	Geologist /s/ John S. Simitz	4/9/08
Cultural Resources	X	Archaeologist Pat Flanary	4/16/08
Native American Religious Concerns	X		
Environmental Justice	**X**	Environ. Prot. Spec .- /s/ Richard G. Hill	4/8/08
Areas of Critical Environmental Concern	X	Plan & Environ. None present /s/J H Parman	4/18/08
Farmlands, Prime or Unique	**X**	Realty NO ISSUES /s/ *Scott Sanderford*	4/18/08
Invasive, Non-native Species	√	Range Mgmt. Spec. ***/s/ Joseph M. Navarro***	4/9/08
Wastes, Hazardous or Solid	**X**	Environ. Prot. Spec.- /s/ Richard G. Hill	4/8/08
Threatened or Endangered Species	√	Biologist /s/ D Baggao	4/16/08
Wetlands/Riparian Zones	√		
Wild and Scenic Rivers	X	Outdoor Rec. Planer /s/ Bill Murry	4/15/08
Wilderness	X		

ENVIRONMENTAL ASSESSMENT # NM-510-08-101 FOR July 2008 LEASE SALE

NON-CRITICAL ELEMENTS			
General Topography/Surface Geology	**X**	Environ. Prot. Spec. - /s/ Richard G. Hill	4/8/08
Mineral Resources	X	Geologist /s/ John S. Simitz	4/16/08
Paleontology	X	Archaeology Pat fLanary	4/16/08
Soil	X	Hydrologist /s/ Michael McGee	4/9/08
Watershed/Hydrology	X		
Vegetation	√	Range Mgmt. ***/s/ Joseph M. Navarro***	4/9/08
Livestock Grazing	√		
Special Status Species	√	Biologist /s/ Dan Baggao	4/16/08
Wildlife	√		
Recreation	X	Outdoor Rec. Planer /s/ Bill Murry	4/15/08
Visual Resources	X		
Cave/Karst	X		
Public Health and Safety	**X**	Environ. Prot. Spec. - /s/ Richard G. Hill	4/8/08
Full Field Development, Well Spacing	√	Geologist /s/ Al Collar	4/10/2008
Agreements & Well Liability	**X**	Petroleum Engineer /s/Gary Gourley	4/09/2008
Communitization & Unitization	**X**	Petroleum Engineer /S/ David R. Glass	04/14/2008

BUREAU OF LAND MANAGEMENT
ROSWELL FIELD OFFICE

ENVIRONMENTAL ASSESSMENT FOR JULY COMPETITIVE OIL AND GAS LEASE SALE EA-NM-510-2008-101

CHAPTER 1
INTRODUCTION

It is the policy of the Bureau of Land Management (BLM) as derived from various laws, including the Mineral Leasing Act of 1920, as amended [30 U.S.C. 181 *et seq*.] 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 land 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 Roswell Field Office review of the twelve (12) parcels offered in the July Competitive Oil and Gas Lease Sale that are under the administration of the Roswell Field 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.

1.0 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 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.

1.1 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 Roswell Proposed Resource Management Plan and Final Environmental Impact Statement (1997). The Final Resource Management was approved by the Record of Decision (ROD) signed October 1997. The RMP designated approximately 7.84 million acres of federal minerals open for continued oil and gas development and leasing under Standard Terms and Conditions. The RMP described specific stipulations that would be attached to new leases offered in certain areas.

The leasing decisions of the 1997 Roswell RMP were amended by the 2008 Special Status Species RMPA Amendment. Eight nominated parcels are not open to leasing:

1.) NM-200807-009 Core Management Area – Pulled
2.) NM-200807-010 Core Management Area – Pulled
3.) NM-200807-014 Core Management Area – Pulled
4.) NM-200807-015 Core Management Area – Pulled
5.) NM-200807-016 Core Management Area – Pulled
6.) NM-200807-017 Core Management Area – Pulled
7.) NM-200807-033 Primary Population Area/Occupied Habitat – Pulled
8.) NM-200807-041 Primary Population Area/Occupied Habitat – Pulled

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 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 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 1997/PRMP/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 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.

1.2 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.

Roswell 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 Biological Opinions Cons. #2-22-96-F-102, Cons. #22420-2006-I-0144, and Cons. #22420-2007-TA-0033. No further consultation with the U.S. Fish and Wildlife Service is required at this stage.

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 BLM, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers, and other applicable BLM handbooks.

CHAPTER 2
PROPOSED ACTIONS AND ALTERNATIVES

2.0 Alternatives Including the Proposed Action

Twelve (12) lease parcels were originally nominated and proposed for inclusion in the July 2008 Competitive Oil and Gas Lease Sale.

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 twelve (12) lease parcels from the July lease sale. Surface management would remain the same and ongoing oil and gas development would continue on surrounding federal, private, and state leases.

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.

Socio-economics

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 be expected to 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 to offer for oil and gas leasing four (4) parcels of federal minerals covering 2,960.580 acres administered by the Roswell Field Office. Standard terms and conditions as well as special stipulations would apply. Lease stipulations (as required by Title 43 Code of Federal Registration 3131.3) would be added to the four (4) parcels to address site specific concerns or new information not identified in the land use planning process.

1.) NM-200807-011 Lease stipulations - SENM-S-22, SENM-S-23 and SENM-S-39
2.) NM-200807-012 Lease stipulations - SENM-S-22, SENM-S-23 and SENM-S-39
3.) NM-200807-013 Lease stipulations - SENM-S-22, SENM-S-23 and SENM-S-39
4.) NM-200807-042 Lease Stipulations - SENM-S-17 and SENM-S-18

The four (4) parcels in their entirety would be included in the lease sale. Parcel number, acreage, and location of parcels are listed in Appendix 1, Table 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 (Title 43 Code of Federal Registration 3101.1-4).

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 lessee 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 secures approval of a drilling permit and a surface use plan specified in Title 43 Code of Federal Registration 3162.

It is recommended to the State Director that the BLM-RFO will not offer for oil and gas leasing eight (8) deferred parcels of federal minerals covering 4,591.640 acres administered by the Roswell Field Office. No lease stipulations (as required by Title 43 Code of Federal Registration 3131.3) would be added to the eight (8) deferred parcels and acreage to address site specific concerns or new information not identified in the land use planning process. Standard terms and conditions as well as special stipulations listed in the RMP would not be applied to the deferred lease sale parcels.

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 1997/PRMP/FEIS.

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

CHAPTER 3
AFFECTED ENVIRONMENT

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 following elements are not present: Areas of Critical Environmental Concern, Prime or Unique Farmlands, Wild and Scenic Rivers, Wetlands /Riparian Zones, Wilderness or Wilderness Study Areas, and Wild Horses and Burros.

The proposed lease parcels are located in Chaves, Roosevelt, and Quay Counties, New Mexico. These parcels are described in the 1997 Roswell RMP Record of Decision. Additional general information on air quality in these areas is contained in Chapter 3 of the Roswell Draft RMP/Environmental Impact Statement.

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 (CO_2) methane (CH_4); nitrous oxide (N_2O); 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

The area of the proposed action is considered a Class II air quality area. A Class II area allows moderate amounts 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 areas of the proposed lease tracts is generally good. None of the potential lease tracts are located in any of the areas designated by the Environmental Protection Agency as "non-attainment areas" for any listed pollutants regulated by the Clean Air Act.

Greenhouse gases, including carbon dioxide (CO_2) and methane (CH_4), and the potential effects of GHG emissions on climate, are not regulated by the 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 Cultural and Paleontology Resources

Once the decision is made by the lessee to develop a lease, area specific cultural records review would be done to determine if there is a need for a cultural inventory of the areas that could be affected by the subsequent surface disturbing activities. Generally, a cultural inventory will be required and all historic and archeological sites that are eligible for listing in the National register of Historic Places or potentially eligible to be listed would be either avoided by the undertaking or have the information in the sites extracted through archeological data recovery prior to surface disturbance.

Parcels in this lease sale may contain vertebrate fossils and the same cultural reviews would apply for the Paleontology Resources.

3.3 Native American Religious Concerns

A review of existing information indicates the proposed actions are outside any known Traditional Cultural Property.

3.4 Environmental Justice

Executive Order 12898 requires Federal agencies to assess projects to ensure there is no disproportionately high or adverse environmental, health, or safety impacts on minority and low-income populations. A review of the parcels offered for lease indicates there are no impacts on minority and low-income populations.

3.5 Floodplains

Portions of Parcel NM-200807-042 consists of un-named intermittent streams and rivers, and floodplains. Attach lease stipulation to SENM-S-18:

T.0090N, R.0330E, NM PM, NM
Sec. 027 E2NW, SW, S2SE;
028 S2;
033 W2.

3. 6 Invasive, Non-native Species

Once the decision is made by the lessee to develop a lease, area specific Invasive and Non native species (Weed) inventory review is done to determine if there is a need for a weed inventory of the areas to be affected by surface disturbing activities. Generally, an Invasive and Non native species (Weed) inventory would be required. While there are no known populations of invasive or non-native species on the propose parcels, infestations of noxious weeds can have a disastrous impact on biodiversity and natural ecosystems. Noxious weeds affect native plant species by out-competing native vegetation for light, water and soil nutrients. Noxious weeds cause estimated losses to producers $2 to $3 billion annually. These losses are attributed to: (1) Decreased quality of agricultural products due to high levels of competition from noxious weeds; (2) decreased quantity of agricultural products due to noxious weed infestations; and (3) costs to control and/or prevent the noxious weeds.

Furthermore, noxious weeds can negatively affect livestock and dairy producers by making forage either unpalatable or toxic to livestock, thus decreasing livestock productivity and potentially increasing producers' feed and animal health care costs. Increased costs to operators are eventually borne by consumers.

Noxious weeds also affect recreational uses, and reduce realty values of both the directly influenced and adjacent properties.

Recent federal legislation has been enacted requiring state and county agencies to implement noxious weed control programs. Monies would be made available for these activities from the federal government, generated from the federal tax base. Therefore, all citizens and taxpayers of the United States are directly affected when noxious weed control prevention is not exercised.

3.7 Threatened or Endangered Species

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. RFO reviewed and determined the proposed action is in compliance with listed species management guidelines outlined in the Biological Opinions Cons. #2-22-96-F-102, Cons. #22420-2006-I-0144, and Cons. #22420-2007-TA-0033. No further consultation with the U.S. Fish and Wildlife Service is required.

3.8 Wastes, Hazardous or Solid

On leased parcels that could have subsequent proposed surface disturbing projects from proposed and approved APDs, no waste material would be removed from the project areas and upon reclamation of the surface disturbed activities, such as the reserve pit areas for example, the more stringent New Mexico Oil Conservation Division pit reclamation guidelines would be imposed where applicable to contain any oil or gas field hazardous or solid waste.

3.9 Water Quality – Surface/Ground

Surface water within the area is affected by geology, precipitation, and water erosion. Factors that currently affect surface water resources include livestock grazing management, oil and gas development, recreational use and brush control treatments. No perennial surface water is found on public land in the proposed lease areas. Intermittent streams and rivers are located within the area of the proposed lease sale. Ephemeral surface water within the area may be located in tributaries, playas, alkali lakes and stock tanks.

Groundwater within the area is affected by geology and precipitation. Factors that currently affect groundwater resources in the area include livestock grazing management, oil and gas development, groundwater pumping, and possible impacts from brush control treatments. Most of the groundwater in the area is used for industrial, rural, domestic and livestock purposes.

3.10 General Topography/Surface Geology

The topographic characteristics and/or regional setting of the project area are: The lands involved in this lease sale have topographic forms that naturally vary, not only to the nature of the land, but in differences in rock and soil texture and composition. The lease parcel areas may vary from hilly uplands to flat lands and with different degrees of sloping from place to place. The horizontal strata of the leasable areas have small mountains, plateau escarpments and other topographical features that are etched out by weathering. The topographic details of the lands in the lease sale are dependent upon differences in rock structure, texture, and attitude that gives rise to prominences of semi-arid desert type surface features.

3.11 Soil

The ***Soil Survey of Chaves County, New Mexico, Southern Part (USDA Soil Conservation Service 1980)*** was used to describe and analyze impacts to soils from the proposed action. The soil map units represented in the project area are:

Berino-Cacique association, 0 to 3 percent slopes (Be) Runoff of the Berino soil is very slow and the hazard of water erosion is slight and the hazard of soil blowing is moderate. Runoff of the Cacique soil is slow and the hazard of water erosion is slight and the hazard of soil blowing is moderate.

Faskin fine sand, 0 to 1 percent slopes (Fa) Runoff is slow and the hazard of water erosion is slight and soil blowing is severe.

Ima fine sandy loam, 1 to 5 percent slopes (Im) Permeability is moderately rapid. Runoff is medium or slow. The hazard or water erosion is severe.

Roswell-Jalmar complex, 0 to 15 percent slopes (Rn) Runoff of the unit soil is very slow and the hazard of water erosion is slight and the hazard of soil blowing is severe.

The ***Soil Survey of Southwest Quay Area New Mexico, (USDA Soil Conservation Service 1960)*** was used to describe and analyze impacts to soils from the proposed action. The soil map units represented in the project area are:

Potter Loam (Pd) Level to strongly sloping soil, very shallow, loamy soils that overlie caliche, runoff is slight.

Pullman loam (Pe) 0 to 2 percent slopes, deep loamy soils, surface runoff is medium and permeability of the subsoil is slow.

Mansker loam (Me) 2 to 5 percent slopes, shallow and moderately deep loam soils, little water runs off the Mansker soils and permeability of the subsoil is moderately rapid. Severe hazard of wind and water erosion.

Mansker loam (Mf) 5 to 10 percent slopes, strongly sloping, shallow and moderately deep loam soils, little water runs off the Mansker soils and permeability of the subsoil is moderately rapid. Severe hazard of wind and water erosion.

The ***Soil Survey of Tucumcari Area, New Mexico, (USDA Soil Conservation Service 1974)*** was used to describe and analyze impacts to soils from the proposed action. The soil map units represented in the project area are:

Bascom-Potter loams (Bg) 1 to 9 percent slopes, runoff is medium on the Bascom soil, and the hazard to soil blowing and water erosion are moderate. Runoff is rapid on the Potter soil, and the hazards of water erosion is moderate.

Rock Land (Ru) 20 to 80 percent slopes, runoff is rapid, and the hazard of water erosion is severe.

Rough Broken and Stony Land (RW) 15 to 25 percent slopes, permeability is slow to moderate, runoff is rapid, hazard of water erosion is severe.

3.12 Watershed – Hydrology

The watershed and hydrology in the area is affected by land and water use practices. The degree to which hydrologic processes are affected by land and water use depends on the location, extent, timing and the type of activity. Factors that currently cause short-lived alterations to the hydrologic regime in the area include livestock grazing management, recreational use activities, groundwater pumping and also oil and gas developments such as well pads, permanent roads, temporary roads, pipelines, and powerlines.

3.13 Vegetation - The parcels indicate portions of the following Plant Communities; Mixed Desert Shrub, Shinnery-Oak Dune & Grassland Communities with Ecological Sites- Sandy SD-3, CP-2 Sandy Plains and CP-2 Sandstone Savannah respectively.

MIXED DESERT SHRUB

Lease parcels are within the mixed desert shrub plant community as identified in the Roswell Resource Management Plan/Environmental Impact Statement (RMP/EIS). Appendix 11 of the Draft RMP/EIS describes the Desired Plant Community (DPC) concept and identifies the components of each community. The mixed desert shrub community is primarily made up of desert grasses, shrubs and cacti. The predominant shrub species include creosote *(Larrea tridentata),* mesquite *(Prosopis glandulosa),* tarbush *(Flourensia cernua),* saltbush *(Atriplex canescens),* little leaf sumac *(Rhus microphylla),* sage (*Artemesia* spp.), yucca *(Yucca* spp.) and javalinabush *(Condalia* spp.) Common cacti encountered are claret cup *(Echinocereus triglochidiatus*), cholla *(Opuntia imbricata),* prickly pear *(Opuntia phaeacantha),* and eagle claw *(Echinocactus horizonthalonius).* Forbs include plantain *(Plantago* spp.), globemallow *(Sphaeralcea* spp.), bladderpod *(Lesquerella* spp.) and buckwheat *(Eriogonum* spp.). Grasses include fluffgrass *(Dasyochloa pulchella),* sideoats grama *(Bouteloua curtipendula),* black grama *(Bouteloua eriopoda),* burrograss *(Scleropogon brevifolius),* dropseed *(Sporobolus* spp.), tobosa *(Pleuraphis mutica)* and blue grama *(Bouteloua gracilis).* Additional species included are gyp grama (*Bouteloua breviseta),* coldenia *(Coldenia* spp.), gyp muhly (Muhlenbergia spp.) and Mormon tea (Ephedra spp.). Biological crusts also make up a major portion of this soil surface where gyp inclusions may occur; these crusts are indicative of gyp outcrop soil and protect the surface from undue erosion.

SHINNERY-OAK DUNE

Lease parcels are within the shinnery-oak dune vegetative community as identified in the Roswell Resource Management Plan/Environmental Impact Statement (RMP/EIS). Appendix 11 of the RMP/EIS describes the Desired Plant Community (DPC) concept and identifies the components of each community. The primary features in the shinnery oak dune (SOD) community are topography influenced by aeolian and alluvial sedimentation on upland plains forming hummocks, dunes, sand ridges and swales and the presence of shinnery oak *(Quercus havardii).* The topography is gently sloping and undulating sandy plains, with moderate to very steep hummocky dunes of up to ten feet and more in height scattered throughout the area. Some of the dunes are stabilized with vegetation, while a number of them are unstable and shifting. Dune blowouts with shinnery oak and bluestem, either isolated or in dune complexes are common in this community. Dominant grasses include sand bluestem *(Andropogon hallii),* little bluestem *(Schizachiyrium scoparium),* and three-awn *(Aristida* spp.).

GRASSLAND COMMUNITY

Lease parcels are within the Grassland Plant Community (GR) as identified in the Roswell Resource Management Plan/Environmental Impact Statement (RMP/EIS). Appendix 11 of the Draft RMP/EIS describes the Desired Plant Community (DPC) concept and identifies the components of each community. The distinguishing feature for the grassland community is that grass species typically comprise 75% or more of the desired plant community. Short-grass, mid-grass and tall-grass species may be found within this community such as blue grama *(Bouteloua*

gracilis), black grama *(Bouteloua eriopoda),* tobosa *(Pleuraphis mutica)* and burrograss *(Scleropogon brevifolius).* This community also includes shrub, half-shrub and forb species. The percentages of grasses, forbs and shrubs actually found at a particular location will vary with recent weather factors and past resource uses.

3.14 Livestock Grazing

The parcels proposed in this lease sale (NM-200807-011, 012 & 013); cover portions of one grazing allotment #65075, Turkey Track, formerly #65073. Allotments are yearlong grazing with cow/calf herds. A range trend study plot is associated with NM-200807-012; Veg id # 388. Mitigation is included in reference to any possible impacts to this BLM study area.

The parcel in Quay County is currently unalloted.

3.15 Wildlife

The entire area provides a myriad of habitat types for terrestrial and aquatic wildlife species. The diversity and abundance of wildlife species in the area is due to the presence Grasslands, Shinnery Oak Dunes, Pecos River floodplain, a mixture of grassland habitat and mixed desert shrub vegetation, and escarpments which divides the uplands from the Pecos River valley.

Common bird species are mourning dove, mockingbird, white-crowned sparrow, black-throated sparrow, blue grosbeak, northern oriole, western meadowlark, Crissal thrasher, western kingbird, northern flicker, common nighthawk, loggerhead shrike, and roadrunner. Raptors include northern harrier, Swainson's hawk, American kestrel, and occasionally golden eagle and ferruginous hawk.

Common mammal species using the area include mule deer, pronghorn, coyote, gray fox, bobcat, striped skunk, porcupine, raccoon, badger, jackrabbit, cottontail, white-footed mouse, deer mouse, grasshopper mouse, kangaroo rat, spotted ground squirrel, and woodrat.

A variety of herptiles also occur in the area such as yellow mud turtle, box turtle, eastern fence lizard, side-blotched lizard, horned lizard, whiptail, hognose snake, coachwhip, gopher snake, rattlesnake, and spadefoot toad.

3.16 Special Status Species

In accordance with BLM Manual 6840, BLM manages certain sensitive species not federally listed as threatened or endangered in order to prevent or reduce the need to list them as threatened or endangered in the future. Included in this category are State listed endangered species and Federal candidate species which receive no special protections under the Endangered Species Act. Special status species with potential to occur in the proposed project area are listed in Table 3.19.1.

Table 3.19.1 Habitat descriptions and Presence of BLM Roswell Field Office Special Status Species.

Common Name (scientific name)	Status	Habitat	Presence*
Lesser prairie chicken (*Tympanuchus pallidicinctus*)	Candidate	Shinnery Oak Dune	**K**
Sand dune lizard (*Sceloporus arenicolus*)	State Endangered	Shinnery Oak Dune	**S**

Presence*
K - Known, documented observation within project area.
S - Habitat suitable and species suspected to occur within the project area.

3.17 Visual Resources

Visual Resource Management (VRM) on public lands is conducted in accordance with BLM Handbook 8410 and BLM Manual 8411.

3.18 Recreation

The lease areas are primarily used by recreational visitors engaged in (hunting) (caving) (sight seeing) (driving for pleasure) (off-highway vehicle use) and other recreational activities. Non-recreation visitors include oil and gas industrial workers and ranchers.

3.19 Cave/Karst

No surface cave/karst features were observed in the immediate vicinity of the proposed actions. However, the proposed leases may be located in the High, Medium and Low Karst Potential Areas.

3.20 Public Health and Safety

The area containing the lease parcels has been under oil and gas development for many years. 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.

3.21 Unplugged Well Agreements and Liability

There are no unplugged wells within any of the parcels listed in this July Lease Sale or parcels in reference to this EA.

3.22 Unitization or Communitization

None of these parcels listed for the July 2008 lease sale or parcels in reference to this EA are within an authorized or proposed Unitization or Communitization Agreement.

CHAPTER 4
ENVIRONMENTAL IMPACTS

4.0 Environmental Consequences and Proposed Mitigation Measures

Alternative A - No Action

Under the No Action Alternative, the proposed parcels would not be leased. There would be no subsequent impacts from oil and/or gas construction, drilling, and production activities. Under the No Action Alternative would result in the continuation of the current land and resource uses in the proposed lease areas. The No Action Alternative is also used as the baseline for comparison of alternatives.

Alternative - Proposed Action

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 Roswell Field Office has resulted in an average total of 55 wells drilled on federal leases annually. 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 developed for the Roswell RMP demonstrated 60 wells would be drilled annually for Federal minerals. (The petroleum resources specific to these leases in the Proposed Action are not known whether they are gas or oil or a combination thereof. Oil wells are on a tighter spacing than gas wells, therefore it is unknown the specific number of wells that would be drilled as a result of issuing the leases. However, the RFD takes these assumptions into account, and on a Field Office wide basis, is still valid.) Current APD permitting trends within the field office confirm that these assumptions are still accurate. This level of exploration and production, as well as issuing the leases in the proposed action, 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.

Coalbed methane does not exist within the field office and, therefore, there are no emissions from this source.

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 CO_2 and CH_4 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, which 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 Roswell Field 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 Cultural and Paleontological Resources

While the act of leasing a parcel would produce no impacts, subsequent development of the lease could have impacts on archaeological and paleontological resources. Required archaeological surveys would be conducted upon all subsequent actions that are expected to occur from the lease sale to avoid disturbing cultural and/or paleontological sites.

4.2.1 Direct and Indirect Impacts

Consequential project construction has the potential to impact cultural and paleontological resources.

4.2.2 Mitigation

Avoidance measures would be imposed were ever cultural and/or paleontological resources are impacted.

4.3 Environmental Justice

4.3.1 Direct and Indirect Impacts

No minority or low income populations would be directly affected in the vicinity of the proposed actions from subsequent proposed oil or gas projects. Indirect impacts could include impacts 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 impacts could include a small increase in activity and noise disturbance in areas used for grazing, wood gathering or hunting. However, these impacts would apply to all public land users in the project area.

4.3.2 Mitigation - None required.

4.4 Floodplains

4.4.1 Direct and Indirect Impacts

The act of leasing Federal minerals produces no impacts to floodplains. However, the subsequent development may produce impacts in the form of surface disturbance. Surface disturbance from the development of well pads, access roads, pipelines, and powerlines can result in impairment of the floodplain values from removal of vegetation, removal of wildlife habitat, impairment of water quality, decreased flood water retention and decreased groundwater recharge.

4.4.2 Mitigation

Parcel NM-200807-042 has stipulation SENM-S-18 attached to T.0090N, R.0330E, NM PM, NM; Sec. 027; E2NW, SW, S2SE; 028; S2; 033; W2, for the purpose of protecting streams, rivers and floodplains, surface disturbance will not be allowed within up to 200 meters of the outer edge of 100-year floodplains, to protect the integrity of those floodplains.

4.5 Invasive, Non-native Species

4.5.1 Direct and Indirect Impacts

While the act of leasing Federal minerals produces no impacts, subsequent development produces impacts in the form of surface disturbance. The construction of an access road and well pad may unintentionally contribute to the establishment and spread of noxious weeds. Noxious weed seed could be carried to and from the project areas by construction equipment, the drilling rig and transport vehicles. The main mechanism for seed dispersion on the road and well pad is by equipment and vehicles that were previously used and or driven across or through noxious weed infested areas. The potential for the dissemination of invasive and noxious weed seed may be elevated by the use of construction equipment typically contracted out to companies that may be from other geographic areas in the region. Washing and decontaminating the equipment prior to transporting onto and exiting the construction areas would minimize this impact.

Impacts by noxious weeds will be minimized due to requirements for the company to eradicate the weeds upon discovery. Multiple applications may be required to effectively control the identified populations.

4.5.2 Mitigation

In the event noxious weeds are discovered during construction of any access roads and well pads, measures will be taken to mitigate those impacts.

4.6 Threatened or Endangered Species

Under Alternative B, there would be no impact to listed species as they would not occur in the area or impacts on the species have been determined to be “may affect, not likely to adversely affect.”

4.6.1 Direct and Indirect Impacts - None.

4.6.2 Mitigation - None.

4.7 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.

4.7.1 Direct and Indirect Impacts

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.

4.7.2 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 stringiest regulation of waste containment within the project areas.

4.8 Water Quality: Surface and Groundwater

4.8.1 Direct and Indirect Impacts

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.

4.8.2 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 breech, 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.

4.9 General Topography /Surface Geology

The general topography and surface geology of the lease parcels are generally impacted by the construction projects that are permitted as a result of subsequent APD actions.

4.9.1 Direct and Indirect Impacts

The direct impact from a lease sale is that the lands involved could fall within an environmental sensitive area and subsequent lease actions could impact the issues of environmental concern. Split estate is an issue of concern on a lease sale when and if a private surface landowner is not in agreement with the proposed project which could create an environmental sensitive area until the issues are resolved with the surface owner. Indirectly the proposed projects could fall within protected areas that would require changing the spacing requirements of a well by moving the location or road.

4.9.2 Mitigation

The lease sale could have mitigation measures imposed on the proposed subsequent action when and if the concern involves the issuance of such mitigation measures that are deemed necessary to resolve the environmental predicament.

4.10 Soil

4.10.1 Direct and Indirect Impacts

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.

4.10.2 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 constructions 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.

4.11 Watershed - Hydrology

4.11.1 Direct and Indirect Impacts

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.

4.11.2 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.

4.12 Vegetation

4.12.1 Direct and Indirect Impacts

At this stage (lease sale) there are no impacts. Impacts (both direct and indirect) would occur when the lease is developed in the future. The potential impacts would be analyzed on a site specific basis prior to oil and gas development. Parcel NM-200807-012 has on the E2SW of Section 6, T. 13 S., R. 29 E., a long-term range trend plot location that may be impacted in the future.

4.12.2 Mitigation – At the lease stage there are no impacts to the trend plot.

4.13 Livestock Grazing

4.13.1 Direct and Indirect Impacts - At the lease stage there are no impacts to livestock grazing.

4.13.2 Mitigation - None

4.14 Special Status Species

Under Alternative B, no new leasing is allowed in the Core Management Area and occupied habitat within the Primary Population Area. The eight parcels that lie within these categories are no available for leasing per the decisions within the 2008 Special Status Species RMPA Amendment. Therefore, there are no impacts to the habitats of either the lesser prairie-chicken or the sand dune lizard.

4.14.1 Direct and Indirect Impacts

None

4.14.2 Mitigation

None necessary.

4.15 Wildlife

Under Alternative B, wildlife habitat would be protected by deferring those parcels that fall within Zone 1 of Interim Management.

4.15.1 Direct and Indirect Impacts

Subsequent lease development would impact wildlife due to surface disturbance and habitat fragmentation. The magnitude of impacts would depend on the exact location and time of development in relation to the affected wildlife species and habitat. These impacts would be analyzed on a site specific basis prior to development.

4.15.2 Mitigation

Stipulations and conditions of approval would be applied at the APD level to minimize wildlife impacts.

4.16 Recreation

While the act of leasing Federal minerals produces no impacts, subsequent development of a lease would generate impacts to recreation activities. In public land that are small or land locked by private or state land, recreation opportunities that could occur in this area would be limited or non-existent due to land patterns. In isolated tracks of public land that generally do not have access through state land or county or state roads, oil and gas activities would have little or no affect on the recreational opportunities in this area. In larger blocks of public land recreation activities that could occur within this area are limited to access from BLM lands, county roads or through state land during hunting seasons.

4.16.1 Direct and Indirect Impacts - None

4.16.2 Mitigation - None

4.17 Visual Resources

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

The VRM Class III objective is to partially retain existing landscape character. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate a casual observer's view. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. Facilities, such as produced water, condensate 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, other than facilities greater in height than eight feet, would slightly modify the existing area visual resources. 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. Under visual resource Class III, the method for repeating the basic elements would be to remove strong vertical and horizontal contrast through use of low-profile facilities as reflected in the Roswell RMP (1997, p. AP1-4). Depending on the production nature of the well site, multiple low-profile condensate and/or oil or produced water tanks would be necessary to accommodate the project. Through color manipulation, by painting well facilities to blend with the rolling to flat vegetative and/or landform setting with a flat gray-green color, the view is expected to favorably blend with the form, line, color and texture of the existing landscape. The flat color Olive Drab from the supplemental environmental colors also closely approximates the gray green color of the setting. All facilities, including the meter building, would be painted this color. Cumulative adverse visual impacts can be avoided by gradually moving into a more appropriate vegetative/landform setting color scheme. Facilities with low-profile horizontal line and form would facilitate favorable blending as older facilities go out of production and are removed.

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 gray-green color. The view is expected to favorably blend with the form, line, color and texture of the existing landscape. The flat Olive Drab from the supplemental environmental colors also closely approximates the gray green color of the setting. All facilities, including the meter building, would be painted this color. Cumulative adverse visual impacts can be avoided by gradually moving into a more appropriate vegetative/landform setting color scheme.

4.17.1 Direct and Indirect Impacts

Through color manipulation, by painting well facilities to blend with the rolling to flat vegetative and/or landform setting with a gray-green the view is expected to favorably blend with the form, line, color and texture of the existing landscape

4.17.2 Mitigation

The flat color Olive Drab 18-0622 TPX from the Supplemental Environmental Colors Chart is to be used on all facilities to closely approximate the vegetation within the setting. All facilities, including the meter building, would be painted this color. If the proposed area is in a scenic corridor a low profile tank less than eight feet in high may be recommended for the proposed action.

4.18 Cave/Karst

The tracts proposed for leasing may be located in a low, medium or high karst potential area. If the lease is in a low karst potential area there may be very little challenges in producing petroleum products from this location. If the proposed lease is in a medium or high karst potential area there could be the potential of adverse impact to known cave entrances or karst features is present within the lease area.

4. 18.1 Direct and Indirect Impacts - Leasing does not in itself cause a problem to a cave or karst area.

4.18.2 Mitigation - NONE

4.19 Public Health and Safety

Public Health and Safety would not be impacted by the leasing of the parcels.

4.19.1 Direct and Indirect Impacts

The subsequent construction, drilling, and production operations could have direct impacts on public health and safety during the conduct of oil and gas activities on the lease. Indirectly if the operations on subsequent lease actions are carried out in a safe workman like manner, no impacts are anticipated.

4.19.2 Mitigation

Upon subsequent proposed projects mitigation measures may be attached to the condition of approval if the operations are not conducted in a professional constructive manner.

4.20 Cumulative Impacts

The Roswell Field Office manages Federal hydrocarbon resources in Chaves, Roosevelt, and Quay counties. There are about 8,550 wells in these counties. About 41 percent (3,500) of the wells in these counties are Federal wells.

Data from 1993 – 2005 indicate about 94 wells are drilled in these counties annually. About 20 wells per year are drilled on Federal mineral lands in these counties.

Estimates of total surface disturbance for this lease sale action are based on full field development. Full field development assumes development of every spacing unit and has a total complement of roads, pads, power lines, gravel sources and pipelines. Exploration and development of hydrocarbon resources outside of well-developed areas increases the distance required for roads, pipelines, and power lines. The parcels offered are not within or near well-developed fields.

The surface disturbance assumptions shown in the following table estimate impacts associated with oil and gas exploration and development drilling activities in these areas.

- Access Roads: 14 foot-wide travel way, 3.0 acres disturbance per access road
- Drill Pads: 1.4 acres disturbance per average well pad (250 feet x 250 feet
- Pipelines: 3.6 acres initial disturbance per producing well (30 feet right-of-way width)
- Power lines: 1.0 acre initial disturbance per producing well

(9 acres total disturbance per well)

*assumes all surface disturbance is on the parcel acreage

Full Field Development *				
parcel	acres in parcel	acres disturbed 40 acre spacing	acres disturbed 160 acre spacing	acres disturbed 320 acre spacing
NM-200807-011	480.390	117	36	18
NM-200807-012	480.190	117	36	18
NM-200807-013	320.000	72	18	9
NM-200807-042	1680.000	378	99	54

Cumulative Impact Table (Based on Full Field Development)

	40-ACRE SPACING	**160-ACRE SPACING**	**320-ACRE SPACING**
Soil	21% -23% of parcel acreage	5% - 7% of parcel acreage	2% - 3% of parcel acreage
Water Resources	21% -23% of parcel acreage	5% - 7% of parcel acreage	2% - 3% of parcel acreage
Floodplains	21% -23% of parcel acreage	5% - 7% of parcel acreage	2% - 3% of parcel acreage
Air Quality	21% -23% of parcel acreage	5% - 7% of parcel acreage	2% - 3% of parcel acreage
Cultural Resources	21% -23% of parcel acreage	5% - 7% of parcel acreage	2% - 3% of parcel acreage
Paleontological Resources	21% -23% of parcel acreage	5% - 7% of parcel acreage	2% - 3% of parcel acreage

NOTE: PROJECTIONS BELOW ARE UNDER REVIEW BY NM SO.

Analysis of cumulative impacts for reasonably foreseeable development (RFD) of oil and gas wells on public lands in the Roswell Field Office was presented in the 1994 Draft Roswell Resource Management Plan (RMP). The RFD was validated in the 2006 Draft Special Status Species RMP Amendment. Potential development of all available federal minerals in the field office, including those in the proposed lease parcels, was included as part of the analysis.

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 CO_2 and CH_4 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.[1] **As of 2002, the Inventory indicates that there approximately 21,771 oil wells and 23,261 gas wells in the State.**

An average of 55 oil and gas wells are drilled on federal minerals per year within the Roswell Field Office. The total average of the 55 new oil and gas wells represent approximately less than 1 percent (.001) of the total number of wells in the State of New Mexico based on the Inventory above.

These average number of oil and gas wells drilled annually in the Field Office 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 change 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.

1 Significant uncertainties remain with respect to: the quality of historical field data, processing, and pipeline use of natural gas, does not factor in reclaimed wells and total number of new wells drilled per year; CO_2 emissions from enhanced oil recovery, which have not been estimated; and refinery fuel use-EIA indicates less than half the refinery fuel use as indicated by refinery permit data.

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 Roswell Field Office, Surface Use and Occupancy Requirements, Conditions of Approval, and the Roswell Field 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 Roswell Approved Resource Management Plan and Record of Decision, October 1997. An environmental analysis will be prepared on a case-by-case basis upon receipt of future subsequent actions.

6.0 Consultation/Coordination

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

BLM Lease Staff

Richard Hill, Environmental Protection Specialist
Al Collar, Geologist
Joseph Navarro, Rangeland Management Specialist
Pat Flanary, Archaeologist
Michael McGee, Hydrologist
John Simitz, Geologist
Dan Baggao, Wildlife Biologist
Angel Mayes, Assistant Field Manager - Lands & Minerals
Phil Watts, GIS Specialist
Jerry Dutchover, Minerals
Howard Parman, Planning and Environmental Coordinator
Gary Gourley, Petroleum Engineer
David Glass, Petroleum Engineer
Scott Sanderford, Realty Specialist

7.0 References

EPA Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006. Environmental Protection Agency, Washington, D.C.

EPA, Natural Gas Star Program (2006 data) at: http://www.epa.gov/gasstar/accomplish.htm. Environmental Protection Agency, Washington, D.C.

Enquist, Carolyn and Gori, Dave. Implications of Recent Climate Change on Conservation Priorities in New Mexico. April 2008.

Goddard Institute for Space Studies. 2007. Annual Mean Temperature Change for Three Latitude Bands. Datasets and Images. GISS Surface Temperature Analysis, Analysis Graphs and Plots. New York, New York. (Available on the Internet: http://data.giss.nasa.gov/gistemp/graphs/Fig.B.lrg.gif.)

Intergovernmental Panel on Climate Change (IPCC). 2007. Climate Change 2007: The Physical Basis (Summary for Policymakers). Cambridge University Press. Cambridge, England and New York, New York. (Available on the Internet: http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf)

Intergovernmental Panel on Climate Change (IPCC). Climate Change 2007, Synthesis Report. A Report of the Intergovernmental Panel on Climate Change.

National Academy of Sciences. 2006. Understanding and Responding to Climate Change: Highlights of National Academies Reports. Division on Earth and Life Studies. National Academy of Sciences. Washington, D.C. (Available on the Internet: http://dels.nas.edu/basc/Climate-HIGH.pdf.)

U.S. Department of the Interior, Bureau of Land Management. 1997. Roswell Proposed Resource Management Plan and Final Environmental Impact Statement. Roswell, New Mexico.

U.S. Department of the Interior, Bureau of Land Management. 1997. Roswell Approved Resource Management and Plan Record of Decision. Roswell, New Mexico.

U.S. Department of the Interior, Bureau of Land Management. 2008. Special Status Species Resource Management Plan Amendment and Record of Decision. Roswell, New Mexico.

7.1 Authorities

Code of Federal Regulations (CFR) 3100
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.

U.S. Department of the Interior, Bureau of Land Management and Office of the Solicitor (editors). 2001. The Federal Land Policy and Management Act, as amended. Public Law 94-579.

Appendix 1

Table 1. Proposed Action

Parcel Number	Legal Description	Acres	Stipulations
NM-200807-011	T.0130S, R.0290E, NM PM, NM Sec. 005 LOTS 1, 3, 4; 005 SENE, S2NW, SW, E2SE; Chaves County	480.390 Acres	SENM-S-22 SENM-S-23 SENM-S-39
NM-200807-012	T.0130S, R.0290E, NM PM, NM Sec. 006 LOTS 1, 2, 3; 006 S2NE, SENW, E2SW, SE; Chaves County	480.190 Acres	SENM-S-22 SENM-S-23 SENM-S-39
NM-200807-013	T.0130S, R.0290E, NM PM, NM Sec. 008 E2; Chaves County	320.000 Acres	SENM-S-22 SENM-S-23 SENM-S-39
NM-200807-042	T.0090N, R.0330E, NM PM, NM Sec. 027 N2NE, E2NW, SW, S2SE; 028 S2; 033 S2NE, W2, SE; 034 NE, S2NW, SW; Quay County	1680.000 Acres	SENM-S-17 All SENM-S-18 T.0090N, R.0330E, NM PM, NM Sec. 027 E2NW, SW, S2SE; 028 S2; 033 W2.

Table 2. Parcels Removed

The following parcels are located in areas closed to new leasing as described in the 2008 Special Status Species Resource Management Plan Amendment.		
Parcel Number	**Legal Description**	**Acres**
NM-200807-009	T.0130S, R.0290E, NM PM, NM Sec. 003 LOTS 1-4; 003 S2N2, S2; Chaves County	640.260 Acres Core Management Area
NM-200807-010	T.0130S, R.0290E, NM PM, NM Sec. 004 LOTS 1-4; 004 S2N2, S2; Chaves County	640.220 Acres Core Management Area
NM-200807-014	T.0130S, R.0290E, NM PM, NM Sec. 009 N2; Chaves County	320.000 Acres Core Management Area

NM-200807-015	T.0130S, R.0290E, NM PM, NM Sec. 009 S2; Chaves County	320.000 Acres Core Management Area
NM-200807-016	T.0130S, R.0290E, NM PM, NM Sec. 010 N2; Chaves County	320.000 Acres Core Management Area
NM-200807-017	T.0130S, R.0290E, NM PM, NM Sec. 010 S2; Chaves County	320.000 Acres Core Management Area
NM-200807-033	T.0070S, R.0320E, NM PM, NM Sec. 022 S2NE; 023 N2, N2SW; 024 N2	800.000 Acres Primary Population Area – Occupied Habitat
NM-200807-041	T.0070S, R.0330E, NM PM, NM Sec. 013 W2NE; 015 S2SE; 019 LOTS 1, 2; 019 NE, E2NW; 021 SESE; 027 NW; 029 NENE, NENW; 030 LOTS 1, 2; 030 E2, E2NW; Roosevelt County	1231.160 Acres Primary Population Area – Occupied Habitat