

**DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
ROSWELL FIELD OFFICE**

**Project: January 2011 Competitive Oil and Gas Lease Sale**

**EA Log Number: DOI-BLM-NM-P010-2011-17-EA**

**Location: Various Locations in Roosevelt, Quay, and Curry Counties, New Mexico.**

**Decision Record**

The decision is to accept the Preferred Alternative (Alternative C) and offer Seven (7) parcels of federal minerals totaling 1,994.32 acres for sale in January 2011 with the addition of further stipulations and lease notices to certain parcels. The BLM will not offer for oil and gas leasing 9 parcels of federal minerals covering 1,593.84 acres administered by the Roswell Field Office. The Preferred Alternative is in compliance with the 1997 Roswell Resource Management Plan, as amended.

The following 7 parcels would be offered in the lease sale:

Parcel	Comments	Acres
<b><u>NM-201101-012</u></b> T.0030S, R.0330E, NM PM, NM Sec. 033 SW;	<u>Lease with the following Stipulations:</u> NM-11-LN Special Cultural Resource SENM- S-22 Prairie Chickens SENM-S-51 CSU Farmland	160
<b><u>NM-201101-013</u></b> T.0040S, R.0330E, NM PM, NM Sec. 004 LOTS 1,2; 004 S2NE;	<u>Lease with the following Stipulations:</u> NM-11-LN Special Cultural Resource SENM- S-22 Prairie Chickens SENM-S-51 CSU Farmland	160.16
<b><u>NM-201101-014</u></b> T.0040S, R.0330E, NM PM, NM Sec. 007 LOTS 3,4; 007 E2SW;	<u>Lease with the following Stipulations:</u> NM-11-LN Special Cultural Resource SENM- S-22 Prairie Chickens	157.30
<b><u>NM-201101-015</u></b> T.0040S, R.0330E, NM PM, NM Sec. 014 S2;	<u>Lease with the following Stipulations:</u> NM-11-LN Special Cultural Resource SENM- S-22 Prairie Chickens SENM-S-51 CSU Farmland	320
<b><u>NM-201101-027</u></b> T.0100N, R.0370E, NM PM, NM Sec. 005 LOTS1,3-5; 008 LOTS 1-4; 017 LOTS 1;	<u>Lease with the following Stipulations:</u> NM-11-LN Special Cultural Resource SENM-S-48 Paleontology	152.34

<p align="center"><b><u>NM-201101-029</u></b></p> <p>T.0100N, R.0370E, NM PM, NM  Sec. 017 LOTS4;  017 SWSW;  018 S2S2;  019 NENE;  020 LOTS 1-4  020 NWNW;  029 Lots 1-4;  029 SWSW;  030 S2S2;  031 N2, NESE;</p>	<p><u>Lease with the following Stipulations:</u>  NM-11-LN Special Cultural Resource  SENM-S-48 Paleontology  SENM-S-19 Playas and Alkali Lakes  Sec. 30 SWSW  Sec. 31 SWNE, NENW  SENM-S-20 Springs, Seeps, and Tanks  Sec. 18 SWSE, SESE  Sec. 30 SWSW  Sec. 31 SENE</p>	<p align="center">1004.52</p>
<p align="center"><b><u>NM-201101-031</u></b></p> <p>T.0100N, R.0370E, NM PM, NM  Sec. 030 SWNE;</p>	<p><u>Lease with the following Stipulations:</u>  NM-11-LN Special Cultural Resource</p>	<p align="center">40</p>

**Rationale:**

The seven (7) parcels as described in the EA were reviewed by Roswell Lease Staff, an interdisciplinary group of internal and external resource 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.

The professional opinion of BLM endangered species specialists, using BLM inventory and monitoring data, 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 DOI-BLM-NM-P010-2011-17-EA. 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. It is unknown at this time the significance of these emissions on climate and it has been determined that additional analysis would not lead to further clarification of these impacts.

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 the EA.

**Public Involvement:**

The parcels nominated for this sale, along with the appropriate stipulations from the RMP, were posted online for a two week review period. A comment letter was received from the Center for Biological Diversity (Center) on October 26, 2010 that provided comments on parcels nominated for the January 2011 competitive oil and gas lease auction. Responses to the comments made in regards to the nominated lease parcels are provided in section 7 of this Environment Assessment. Copy of the letter is available at the BLM RFO.

**Administrative Review and Appeal:**

This protest process for this Decision Record has been instituted to reconcile differences between oil and gas lease sale and NEPA regulations; and improve the opportunities for public input into agency decisions. This Decision Record for the Environmental Assessment must be protested under 43 CFR 3120.1-3. Protests must be received within 30 days of the signed decision record. You may file a protest by mail, in hardcopy form or by telefax. You may not file a protest sent to a fax number other than the fax number identified below. Any protests filed by electronic mail will be dismissed. A protest filed by fax must be sent to (505) 954-2000 or by mail to: BLM New Mexico, 301 Dinosaur Trail, PO Box 27115, Santa Fe, NM 87502 Attn: Minerals-Protests.

A protest must state the interest of the protesting party in the matter. The protest must also include any statement of reasons to support the protest. We will dismiss a late-filed protest or a protest filed without a statement of reasons.

If the party signing a protest is doing so on behalf of an association, partnership or corporations, the signing party must reveal the relationship between them. Before including your phone number, e-mail address, or other personal identifying information in your protest, you should be aware that your entire protest – including your personal identifying information – may be made publicly available at any time. While you can ask us in your protest to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Prepared by:

\_\_\_\_\_/s/Glen Garnand\_\_\_\_\_ Date 11/23/2010  
Glen Garnand, Environmental Protection Spec.

Reviewed By:

\_\_\_\_\_/s/Angel Mayes\_\_\_\_\_ Date 11/23/2010  
Angel Mayes, Assistant Field Manager-Lands and Minerals

Approved by:

\_\_\_\_\_/s/Chuck Schmidt\_\_\_\_\_ Date 11/23/2010  
Charles Schmidt, Roswell Field Office Manager



**BUREAU OF LAND MANAGEMENT  
ROSWELL FIELD OFFICE**

**ENVIRONMENTAL ASSESSMENT FOR  
OCTOBER 2010 COMPETITIVE OIL AND GAS LEASE SALE  
DOI-BLM-NM-P010-2010-154-EA**

**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 as amended, to make mineral resources available for disposal and to manage for multiple resources which include the development of mineral resources to meet national, regional, and local needs.

The BLM New Mexico State Office (NMSO) conducts a quarterly competitive lease sale to offer 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 NMSO 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 sixteen (16) parcels offered in the January 2011 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 is to allow private individuals or companies to explore for and develop oil and gas resources on public lands. The need is 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 1997 Roswell Proposed Resource Management Plan (RMP) and Final Environmental Impact Statement. 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 and amended by the 2008 Special Status Species RMP Amendment (RMPA). The Federal Land Policy and Management Act of 1976 (FLPMA) established guidelines to provide for the management, protection, development, and enhancement of public lands (Public Law 94-579).

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 and the 2008 Special Status Species RMPA. 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 comply with 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 Preferred Alternative 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.

## **PROPOSED ACTIONS AND ALTERNATIVES**

### **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 lease parcels nominated for this 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**

The Proposed Action would be a recommendation to the State Director that BLM offer for oil and gas leasing sixteen (16) parcels of federal minerals covering 3,588.16 acres administered by the RFO. Standard terms and conditions as well as special stipulations listed in the RMP and RMPAs would apply. The number of parcels and acres are the same in both Alternatives A and B. For a complete description of these parcels see Appendix 1.

All sixteen (16) parcels, totaling 3,588.16 acres, contain a special Cultural Resources Lease Notice stating that all development activities proposed under the authority of these leases are subject to compliances with Section 106 of the NHPA and Executive Order 13007.

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). 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 Alternative C - Preferred Alternative**

The Preferred Alternative would be the result of an internal review conducted by the Roswell Field Office (RFO) interdisciplinary staff on October 8, 2010. During that meeting it was determined that several new stipulations would need to be developed to protect newly identified resources within certain nominated parcels in the Pecos District. Those resources identified consist of areas that have previously been reclaimed with funds under the Restore New Mexico program, and areas currently being cultivated for agricultural resources. A complete description of each stipulation can be found in Appendix 2.

In addition, On June 28, 2010 the U.S. Fish and Wildlife Service proposed the listing of the mountain plover (*Charadrius montanus*) as threatened under the Endangered Species Act of 1973. After further review of all sixteen (16) parcels by biologists in the RFO, it was identified that four parcels located in Quay & Curry County contain suitable habitat for the mountain plover. Therefore, those parcels associated with the mountain plover were removed from the sale for further research and mitigation measures.

As a result, it is recommended to the State Director to offer for oil and gas leasing seven (7) parcels of federal minerals covering 1,994.32 acres administered by the RFO, and the BLM will not offer for oil and gas leasing 9 parcels of federal minerals covering 1,593.84 acres administered by the Roswell Field Office. See the notes that accompany the parcel in Appendix 1.

No lease stipulations (as required by Title 43 Code of Federal Registration 3131.3 stipulations) would be added to the removed 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 removed lease sale parcels.

The seven (7) parcels would be included in the lease sale. Parcel number, location, stipulations, and acreage, are listed in the table below. 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 seven (7) parcels to address site specific concerns or new information not identified in the land use planning process.

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 3101.1-2).

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 under Onshore Oil and Gas Orders, Notice to Lessee's (NTL's) listed in Title 43 Code of Federal Registration 3162.

The seven (7) parcels contain a special Cultural Resources Lease Notice stating that all development activities proposed under the authority of these leases are subject to compliance with Section 106 of the NHPA and Executive Order 13007. Standard terms and conditions as well as special stipulations listed in the RMP would apply.

No additional mitigation measures are necessary at this time; however, if parcels are developed in the future, site specific mitigation measures and BMPs would be attached as COAs for each proposed activity.

Parcels recommended for leasing with stipulations:

Parcel	Comments	Acres
<p><b><u>NM-201101-012</u></b> T.0030S, R.0330E, NM PM, NM Sec. 033 SW;</p>	<p><u>Lease with the following Stipulations:</u> NM-11-LN Special Cultural Resource SENM- S-22 Prairie Chickens</p>	<p>160</p>
<p><b><u>NM-201101-013</u></b> T.0040S, R.0330E, NM PM, NM Sec. 004 LOTS 1,2; 004 S2NE;</p>	<p><u>Lease with the following Stipulations:</u> NM-11-LN Special Cultural Resource SENM- S-22 Prairie Chickens</p>	<p>160.16</p>
<p><b><u>NM-201101-014</u></b> T.0040S, R.0330E, NM PM, NM Sec. 007 LOTS 3,4; 007 E2SW;</p>	<p><u>Lease with the following Stipulations:</u> NM-11-LN Special Cultural Resource SENM- S-22 Prairie Chickens</p>	<p>157.30</p>
<p><b><u>NM-201101-015</u></b> T.0040S, R.0330E, NM PM, NM Sec. 014 S2;</p>	<p><u>Lease with the following Stipulations:</u> NM-11-LN Special Cultural Resource SENM- S-22 Prairie Chickens</p>	<p>320</p>
<p><b><u>NM-201101-027</u></b> T.0100N, R.0370E, NM PM, NM Sec. 005 LOTS1,3-5; 008 LOTS 1-4; 017 LOTS 1;</p>	<p><u>Lease with the following Stipulations:</u> NM-11-LN Special Cultural Resource SENM-S-48 Paleontology</p>	<p>152.34</p>
<p><b><u>NM-201101-029</u></b> T.0100N, R.0370E, NM PM, NM Sec. 017 LOTS4; 017 SWSW; 018 S2S2; 019 NENE; 020 LOTS 1-4 020 NWNW; 029 Lots 1-4; 029 SWSW; 030 S2S2; 031 N2, NESE;</p>	<p><u>Lease with the following Stipulations:</u> NM-11-LN Special Cultural Resource SENM-S-48 Paleontology SENM-S-19 Playas and Alkali Lakes Sec. 30 SWSW Sec. 31 SWNE, NENW SENM-S-20 Springs, Seeps, and Tanks Sec. 18 SWSE, SESE Sec. 30 SWSW Sec. 31 SENE</p>	<p>1004.52</p>
<p><b><u>NM-201101-031</u></b> T.0100N, R.0370E, NM PM, NM Sec. 030 SWNE;</p>	<p><u>Lease with the following Stipulations:</u> NM-11-LN Special Cultural Resource SENM-S-48 Paleontology</p>	<p>40</p>

Standard terms and conditions as well as special stipulations would apply as additional lease stipulations (as required by Title 43 Code of Federal Registration 3131.3) to address site specific concerns or new information not identified in the land use planning process.

Nominated parcels deferred or not open to leasing:

<p><b><u>NM-201101-006</u></b> T.0030S, R.0320E, NMPM, NM Sec. 017 E2SE;</p>	<p><b>Deferred- This parcel is being reviewed due to the Mountain Plover Stipulaiton</b></p>	<p>80</p>
<p><b><u>NM-201101-010</u></b> T.0030S, R.0330E, NM PM, NM Sec. 029 NW;</p>	<p><b>Deferred- This parcel is being reviewed due to the Mountain Plover Stipulaiton</b></p>	<p>160</p>
<p><b><u>NM-201101-011</u></b> T.0030S, R.0330E, NM PM, NM Sec. 030 LOTS 3, 4; 030 E2SW;</p>	<p><b>Deferred- This parcel is being reviewed due to the Mountain Plover Stipulaiton</b></p>	<p>156.12</p>
<p><b><u>NM-201101-019</u></b> T.0080S, R.0350E, NMPM, NM Sec. 033 SW;</p>	<p><b>Deferred- This parcel falls within the lesser prairie chicken, where there is no new leasing</b></p>	<p>160</p>
<p><b><u>NM-201101-020</u></b> T.0080S, R.0350E, NMPM, NM Sec. 034 S2NW;</p>	<p><b>Deferred- This parcel falls within the lesser prairie chicken, where there is no new leasing</b></p>	<p>80.0</p>
<p><b><u>NM-201101-026</u></b> T.0080S, R.0370E, NM PM, NM Sec. 030 LOTS 1,2; 030 NE, E2NW;</p>	<p><b>Deferred- This parcel falls within the lesser prairie chicken, where there is no new leasing</b></p>	<p>317.49</p>
<p><b><u>NM-201101-028</u></b> T.0100N, R.0370E, NM PM, NM Sec. 006 LOTS4; 006 SWNW,SW,W2SE;</p>	<p><b>Deferred- This parcel is being reviewed due to the Mountain Plover Stipulaiton</b></p>	<p>320.23</p>
<p><b><u>NM-201101-030</u></b> T.0100N, R.0370E, NM PM, NM Sec. 018 N2N2;</p>	<p><b>Deferred- This parcel is being reviewed due to the Mountain Plover Stipulaiton</b></p>	<p>160</p>
<p><b><u>NM-201101-045</u></b> T.0070N, R.0350E, NM PM, NM Sec. 034 NE;</p>	<p><b>Deferred- This parcel is being reviewed for a reclamation stipulation</b></p>	<p>160</p>

## **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, Floodplains, Wilderness or Wilderness Study Areas, and Wild Horses and Burros.

The offered lease parcels are located in Chaves, Quay, and Curry 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.

#### **3.1 Air Quality**

The Environmental Protection Agency (EPA) has the primary responsibility for regulating air quality, including seven nationally regulated ambient air pollutants. These criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM<sub>10</sub> & PM<sub>2.5</sub>), sulfur dioxide (SO<sub>2</sub>) and lead (Pb). Regulation of air quality is delegated to the State of New Mexico. Air quality is determined by atmospheric pollutants and chemistry, dispersion meteorology and terrain, and includes applications of noise, smoke management, and visibility. The area of the Preferred Alternative is considered a Class II air quality area. A Class II area allows moderate amounts of air quality degradation. The primary sources of air pollution are dust from blowing wind on disturbed or exposed soil and exhaust emissions from motorized equipment.

Air quality in the areas of the proposed lease tracts is generally good as defined by the Air Quality Index. None of the potential lease tracts are located in any of the areas designated by the EPA as “non-attainment areas” for any listed pollutants regulated by the Clean Air Act.

Additional general information on air quality in these areas is contained in Chapter 3 of the Roswell Draft RMP/Environmental Impact Statement.

##### **3.1.2 Climate**

The planning area is located in an arid to semiarid continental climate regime typified by mild winters, windy conditions, limited rainfall, and hot summers (1994 Roswell Draft RMP EIS). Table 3.3 summarizes components of climate that could affect air quality in the region.

<b>Climate Component</b>	<b>Temperature</b>
Mean maximum summer temperatures	92°F
Mean minimum winter temperatures	28°F
Mean annual temperature	62°F

Mean annual precipitation	12.5 inches
Mean annual snowfall	8.6 inches
Mean annual wind speed	12 mile per hour (mph)
Prevailing wind direction	West

In addition to the air quality information in the RMPs cited above, new information about greenhouse gases (GHGs) and their effects on national and global climate conditions has emerged since the RMPs were prepared. 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 and modeling systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions; what is known is that increasing concentrations of GHGs are likely to accelerate the rate of climate change.

Greenhouse gases that are included in the US Greenhouse Gas Inventory are: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>). CO<sub>2</sub> and methane (CH<sub>4</sub>) are typically emitted from combustion activities or are directly emitted into the atmosphere. On-going scientific research has identified the potential impacts of greenhouse gas emissions (including CO<sub>2</sub>; CH<sub>4</sub>; nitrous oxide (N<sub>2</sub>O), water vapor; and several trace gasses) on global climate. Through complex interactions on regional and global scales, these greenhouse gas emissions cause a net warming effect of the atmosphere (which makes surface temperatures suitable for life on Earth), primarily by decreasing the amount of heat energy radiated by the Earth back into space. Although greenhouse gas levels have varied for millennia (along with corresponding variations in climatic conditions), recent industrialization and burning of fossil carbon sources have caused CO<sub>2</sub> concentrations to increase dramatically, and are likely to contribute to overall climatic changes, typically referred to as global warming. Increasing CO<sub>2</sub> concentrations also lead to preferential fertilization and growth of specific plant species.

In 2007, 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 at this time to predict with any certainty the causal connection of site specific emissions from sources to impacts on the global/regional climate relative to the Preferred Alternative and subsequent actions of oil and gas development.

Mean annual temperatures have risen across New Mexico and the southwestern U.S. since the early 20th century. 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. Recurrent research has indicated that predicting the future effects of climate change and subsequent challenges of

managing resources in the Southwest is not feasible at this time (USFS, 2008). However, it has been noted that 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 affected by climate change (Enquist and Gori).

A number of activities contribute to the phenomenon of climate change, including emissions of GHGs (especially carbon dioxide and methane) from fossil fuel development, large wildfires, activities using combustion engines, changes to the natural carbon cycle, and changes to radiative forces and reflectivity (albedo). It is important to note that GHGs will have a sustained climatic impact over different temporal scales due to their differences in global warming potential (described above) and lifespans in the atmosphere.

### **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**

None of the offered lease parcels are located within the 100-year floodplain.

### **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 give rise to prominences of semi-arid desert type surface features.

### **3.11 Soil**

The Soil Conservation Service, now the Natural Resource Conservation Service (NRCS), has surveyed the soils in Roosevelt County. Complete soil information is available in the Soil Survey of Roosevelt County, New Mexico, (USDA Soil Conservation Service 1967). The soil map units represented in the project area are:

Amarillo-Clovis fine sandy loams association: Deep and moderately deep, moderately sandy land.

Amarillo-Clovis loamy fine sands association: Deep and moderately deep sandy land.

The Soil Conservation Service, now the Natural Resource Conservation Service (NRCS), has surveyed the soils in the Tucumcari Area, New Mexico Northern Quay County. Complete soil information is available in the Soil Survey of Tucumcari Area, New Mexico Northern Quay County, New Mexico, (USDA Soil Conservation Service 1974). The soil map units represented in the project area are:

Bascom loam, 3 to 9 percent slopes (BD): Permeability is moderately rapid and the hazard of water erosion is moderate to severe and the hazard of soil blowing is moderate.

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

Bascom complex, 1 to 5 percent slopes (BE): Permeability is moderately rapid. Runoff is medium and the hazards of soil blowing and water erosion are moderate. Runoff is slow on the Canez soil and the hazard of soil blowing is moderate.

Bascom loam, nongravelly variant, 0 to 3 percent slopes (BM): Permeability is moderate. Runoff is medium and the hazards of soil blowing and water erosion are moderate.

Canez loam, calcareous variant, 0 to 3 percent slopes (CV): Permeability is moderate. Runoff is medium and the hazards of soil blowing and water erosion are moderate.

Gallegos very gravelly loam, 1 to 9 percent slopes (GA): Permeability is moderately rapid. Runoff is medium to rapid and the hazard of water erosion is moderate.

Ima sandy loam, 1 to 5 percent slopes (IN): Runoff is slow to medium and the hazard of soil blowing is moderate to severe. The hazard of water erosion is slight to moderate.

La Lande loam, 0 to 5 percent slopes (LR): Permeability is moderate. Runoff is medium to rapid and the hazards of soil blowing and water erosion are moderate.

Los Tanos sandy loam, 1 to 5 percent slopes (LY): Permeability is moderately rapid. Runoff is slow to medium and the hazards of soil blowing and water erosion are moderate.

Montoya clay loam, 0 to 3 percent slopes (MP): Permeability is very slow. Runoff is medium and the hazard to water erosion is moderate.

Potter loam, 1 to 9 percent slopes (PT): Permeability is moderate. Runoff is medium to rapid and the hazard of water erosion is moderate.

San Jon loam, 1 to 5 percent slopes (SB): Permeability is moderately slow. Runoff is rapid and the hazard of water erosion is severe.

Springer fine sandy loam, 0 to 3 percent slopes (SM): Permeability is moderately rapid. Runoff is slow and the hazard of soil blowing is moderate.

Quay loam, 0 to 5 percent slopes (QH): Permeability is moderate. Runoff is slow to medium and the hazards of soil blowing and water erosion are moderate.

Redona fine sandy loam, 0 to 3 percent slopes (RM): Permeability is moderate. Runoff is slow and the hazard of soil blowing is high.

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: Pinon Juniper and the Shinnery-Oak Dune Communities with Ecological Sites- CP-2 Shallow Sandstone and Sandy SD-3, CP-2 Sandy Plains, CP-2 Deep Sand, and CP-2 Sandhills respectively.

#### **PINON JUNIPER**

Lease parcels are within the pinon/juniper 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 consideration in listing range sites under this community types is topography influenced by higher hills and mountains with juniper, pinon or mountain mahogany in the description of the potential plant community.

The pinon/juniper community type is typically found in the mountain slopes and rolling foothills in the west half of the resource area. Smaller areas are scattered in the lower elevations, intermingled with the shortgrass habitat type. Slopes range from 15 to 75 percent, averaging 20 to 30 percent. The average elevation is from 4,500 feet to 7,500 feet.

The majority of the community type includes an intermingling of several other habitat types such as riparian/wetland, drainages/draws/canyons and grassland types. The overstory is dominated by one-seed juniper, pinon pine, and alligator juniper. Ponderosa pine may be found in protected canyon bottoms. The shrubby understory includes wavyleaf oak, little leaf sumac, mountain mahogany, algerita and fourwing saltbush. Forbs and grasses are represented by such species as wild buckwheat, sagewort, greenthread, sideoats grama, blue grama, creeping muhly, wolftail, fescue and wheatgrass.

#### **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 (*Schizachyrium scoparium*), and three-awn (*Aristida* spp.).

#### **3.14 Livestock Grazing**

The parcels proposed in this lease sale (NM-201010-004, 010, 015, 019, 020, 021, 022, & 023) cover portions of grazing allotments #65075, 65001, and 61001, while the remaining parcels are not associated with a BLM grazing allotment. These allotments are authorized yearlong grazing

with cow/calf herds. A range trend study plot is associated with parcel NM-201010-010 contained within grazing allotment #65075. Mitigation is included in reference to any possible impacts to these BLM study areas.

### 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 ( <i>Tympanuchus pallidicinctus</i> )	Candidate	Shinnery Oak Dune	<b>K</b>
Sand dune lizard ( <i>Sceloporus arenicolus</i> )	State Endangered	Shinnery Oak Dune	<b>S</b>

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, sightseeing, 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 January Lease Sale or parcels in reference to this EA.

### **3.22 Unitization or Communitization**

None of these parcels listed for the October 2010 lease sale or parcels in reference to this EA are within an authorized or proposed Unitization or Communitization Agreement.

## **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.

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 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 in the short and long-term by other sources that may include a combination of imports, using alternative energy sources (e.g. wind, solar), and other domestic production. This displacement of supply would offset any reductions in emissions achieved by not leasing the subject tracts in the short-term.

### **Alternative B - Proposed Action**

Alternative B consists of sixteen (16) parcels of federal minerals covering 3,588.16 acres administered by the RFO. Standard terms and conditions as well as special stipulations listed in the RMP and RMPAs would apply. The number of parcels and acres are the same in both Alternatives A and B. Because changes were made to the January 2011 Lease Sale Alternative B – this Proposed Action will not be analyzed further.

### **Alternative C – Preferred Action**

Alternative C – Preferred Action (analyzed below in section 4) contains seven (7) parcels to be offered in the January 2011 Competitive Oil and Gas Lease Sale. The act of leasing the seven (7) parcels would, by itself, have no impact on any resources in the RFO. All impacts would be linked to as yet undetermined future levels of lease development.

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. Potential impacts, lease stipulations and mitigation measures are described below.

Cumulative impacts include the combined effect of past projects, specific planned projects and other reasonably foreseeable future actions such as other infield wells being located within these leases. Potential cumulative effects may occur should an oil and gas field be discovered if these parcels are drilled and other infield wells are drilled within these leases or if these leases become part of a new unit. All actions, not just oil and gas development may occur in the area, including foreseeable non-federal actions.

## **4.1 Air Resources**

### **4.1.1 Air Quality Impacts from All Action Alternatives**

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. Potential impacts of development would include increased air borne soil particles blown from new well pads or roads, exhaust emissions from drilling equipment, compressor engines, vehicles, flares, and dehydration and separation facilities, and volatile organic compounds during drilling or production activities.

The reasonable and foreseeable development scenario developed for the Roswell RMP demonstrated 60 wells would be drilled annually for Federal minerals. However, it is unknown whether the petroleum resources specific to these leases in the Proposed Action are gas or oil or a combination thereof, as well as the actual potential for those resources. In addition, oil wells are on a tighter spacing than gas wells, therefore the specific number of wells that would be drilled as a result of issuing the leases is unknown. Current APD permitting trends within the field office also confirm that these assumptions are still accurate.

Therefore, in order to reasonably quantify emissions associated with well exploration and production activities, certain types of information are needed. Such information includes a combination of activity data such as the types of equipment needed if a well were to be completed successfully (e.g. compressor, separator, dehydrator), the technologies which may be employed by a given company for drilling any new wells, area of disturbance for each type of activity (e.g. roads, pads, electric lines, compressor station), number of days to complete each kind of construction, number of days for each phase of drilling process, type(s), size, number of heavy equipment used for each type of construction (backhoe, dozer, etc.), number of wells of all types (shallow, deep, exploratory, etc.), compression per well (sales, field booster), or average horsepower for each type of compressor. The degree of impact will also vary according to the characteristics of the geologic formations from which production occurs. Since this type of data is unavailable at this time, including scenarios for oil and gas development, it is unreasonable to quantify emissions. What can be said is that exploration and production would contribute to incremental increases in overall air quality emissions associated with oil and gas exploration and production into the atmosphere.

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

#### **Potential Mitigation:**

The BLM encourages industry to incorporate and implement “Best Management Practices” (BMPs), which are designed to reduce impacts to air quality by reducing emissions, surface disturbances, and dust from field production and operations. Typical measures include: adherence to BLM’s Notice to Lessees’ (NTL) 4(a) concerning the venting and flaring of gas on Federal leases; for natural gas emissions that cannot be economically recovered, flare hydrocarbon 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; collocate wells and production facilities to reduce new surface disturbance; implementation of directional drilling and horizontal completion technologies whereby one well provides access to petroleum resources that would normally require the drilling of several vertical wellbores; require that vapor recovery systems be maintained and functional in areas where petroleum liquids are stored; and perform interim reclamation to re-vegetate areas of the pad not required for production facilities and to reduce the amount of dust from the pads.

#### **4.1.2 Climate**

The assessment of GHG emissions, their relationship to global climatic patterns, and the resulting impacts is an ongoing scientific process. It is currently not feasible to know with certainty the net impacts from the proposed action on climate—that is, while BLM actions may

contribute to the climate change phenomenon, the specific effects of those actions on global climate are speculative given the current state of the science. The BLM does not have the ability to associate a BLM action's contribution to climate change with impacts in any particular area. The technology to be able to do so is not yet available. 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 and determining the significance of any discrete amount of GHG emissions is beyond the limits of existing science. 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.

Leasing the subject tracts would have no direct impacts on climate as a result of GHG emissions. There is an assumption, however, that leasing the parcels would lead to some type of development that would have indirect effects on global climate through GHG emissions. However, those effects on global climate change cannot be determined. (Refer to the cumulative effects section, Chapter 4 for additional information.) It is unknown whether the petroleum resources specific to these leases in the Proposed Action are gas or oil or a combination thereof.

Oil and gas production in New Mexico is concentrated in the northwest corner, the San Juan Basin, and the southeast corner, the Permian Basin. Production in the San Juan Basin is mostly natural gas while production in the Permian Basin is mostly oil. Production statistics developed from EPA and New Mexico Oil Conservation Division for 2008 are shown in Table 3 for the US, New Mexico and for wells on federal leases in each basin.

**Table 3: 2008 Oil and Gas Production**

<b>Location</b>	<b>Oil (barrels)</b>	<b>% U.S. Total</b>	<b>Gas (MMcf)</b>	<b>% U.S. Total</b>
United States	1,811,816,000	100	25,754,348	100
New Mexico	60,178,252	3.32	1,473,136	5.72
Federal leases in New Mexico	25,700,000	1.42	920,000	3.57
San Juan Basin	1,600,000	0.09	709,000	2.75
Permian Basin	24,100,000	1.33	211,000	0.82

In order to estimate the contribution of Federal oil and gas leases to greenhouse gases in New Mexico it is assumed that the percentage of total U.S. production is comparable to the percentage of total emissions. Therefore, emissions are estimated based on production starting with total emissions for the United States from EPA 2010, and applying production percentages to estimate emissions for the Permian Basin. It is understood that this is a rather simplistic technique and assumes similar emissions in basins that may have very different characteristics and operational procedures, which could be reflected in total emissions. This assumption is adequate for this level of analysis due to the unknown factors associated with eventual exploration and development of the leases. However, the emissions estimates derived in this way, while not precise will give some insight into the order of magnitude of emissions from federal oil and gas leases administered by the Bureau of Land Management (BLM) and allow for comparison with other sources in a broad sense.

**Table 4: 2008 Oil and Gas Field Production Potential Emissions**

Location	Oil		Gas		Total O&G Production	%U.S. Total GHG emissions
	CO2	CH4	CO2	CH4		
United States	500,000	28,400,000	8,500,000	14,100,000	51,500,000	0.74
New Mexico	16,607	943,287	486,196	806,513	2,252,603	0.03
Federal leases in New Mexico	7,092	402,844	303,638	503,682	1,217,257	0.02
San Juan Basin	442	25,080	233,999	388,164	647,684	0.01
Permian Basin	6,651	377,765	69,639	115,518	569,573	0.01

Table 4 shows the estimated greenhouse gas emissions for oil and gas field production for the U.S., New Mexico, and Federal leases by basin. Because oil and gas leaves the custody and jurisdiction of the BLM after the production phase and before processing or refining, only emissions from the production phase are considered here. It should also be remembered that following EPA protocols, these numbers do not include fossil fuel combustion which would include such things as truck traffic, pumping jack engines, compressor engines and drill rig engines. Nor does it include emissions from power plants that generate the electricity used at well sites and facilities. Note that units of Metric tons CO<sub>2</sub>e have been used in Table 4 to avoid very small numbers. CO<sub>2</sub>e is the concentration of CO<sub>2</sub> that would cause the same level of radiative forcing as a given type and concentration of greenhouse gas. For comparison one million metric tons is equal to one teragram.

Table 4 provides an estimate of direct emissions that occur during exploration and production of oil and gas. This phase of emissions represents a small fraction of overall emissions of CO<sub>2</sub>e from the life cycle of oil and gas. For example, acquisition (drilling and development) for petroleum is responsible for only 8% of the total CO<sub>2</sub>e emissions, whereas transportation of the petroleum to refineries represents about 10% of the emissions, and final consumption as a transportation fuel represents fully 80% of emissions (U.S.DOE, NETL, 2008)

To estimate the potential emissions from the proposed lease sale, an estimate of emission per well is useful. To establish the exact number of Federal wells in the Permian Basin is problematic due to the ongoing development of new wells, the abandonment of unproductive wells, land sales and exchanges, and incomplete or inaccurate data bases. RFO determined that the most transparent and publicly accessible method of estimating the number of active federal wells in the New Mexico portion of the Permian Basin was to utilize the BLM New Mexico Geographic Information System (GIS) and the New Mexico Conservation Division ONGARD Data Search Page. ONGARD was searched for all active, new, and temporarily abandoned wells in NM (54,137), then refined the search to include only Chaves and Roosevelt counties (3,595), and finished the search by limiting the results to Federal wells (1,589).

Table 5 estimated that the total emissions from Federal leases in the Permian Basin in 2008 were

569,573 metric tons CO<sub>2</sub>e. Therefore, the estimate of emission per well is 35.84 metric tons CO<sub>2</sub>e annually. In the unlikely event that 10 separate wells (five wells per lease parcel) were drilled on the proposed leases, the maximum emissions resulting from the lease sale would be 358.45 metric tons CO<sub>2</sub>e per year.

**Table 5: Potential Greenhouse Gas Emissions Resulting from Proposed Lease Sale Referenced to Latest Available Estimates from 2008**

Total U.S. GHG Emissions From All Sources	6,956,800,000 metric tons	100.00 %
Total U.S. GHG Emissions From Oil & Gas Field Production	51,500,000 metric tons	.4%
Total New Mexico Emissions From Oil & Gas Field Production	2,252,603 metric tons	.03%
Total Permian Basin Emissions From Oil & Gas Field Production (1,589 wells)	569,573 metric tons	.01%
Total Potential GHG Emissions From Oil & Gas Field Production at Full Development For Proposed Lease Sale (10 Wells)	358 metric tons	.00006%

Environmental impacts of GHG emissions from oil and gas consumption are not effects of the proposed action as defined by the Council on Environmental Quality, and thus are not required to be analyzed under NEPA. Greenhouse gas emissions from consumption of oil and gas are not direct effects under NEPA because they do not occur at the same time and place as the action. They are also not indirect effects because oil and gas leasing and production would not be a proximate cause of greenhouse gas emissions resulting from consumption.

### **Potential Mitigation**

The EPA's inventory data describes "Natural Gas Systems" and "Petroleum Systems" as the two major categories of total US sources of GHG gas emissions. The inventory identifies the contributions of natural gas and petroleum systems to total CO<sub>2</sub> and CH<sub>4</sub> emissions (natural gas and petroleum systems do not produce noteworthy amounts of any of the other greenhouse gases). Within the larger category of "Natural Gas Systems", the EPA identifies emissions occurring during distinct stages of operation, including field production, processing, transmission and storage, and distribution. "Petroleum Systems" sub-activities include production field operations, crude oil transportation and crude oil refining. Within the two categories, the BLM has authority to regulate only those field production operations that are related to oil and gas measurement, and prevention of waste (via leaks, spills and unauthorized flaring and venting).

The 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 BMPs proposed by the EPA's Natural Gas Energy Star program. The 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 resources. Paleontological surveys will be required in areas where the potential for paleontological resources exist to avoid disturbing the paleontological resource.

### **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 Socio-economics and 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**

None of the offered lease parcels are located within the 100-year floodplain.

### **4.4.2 Mitigation**

None of the offered lease parcels are located within the 100-year floodplain.

## **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 or closed systems or steel tanks 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.

#### **4.9 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 re-contoured 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.

### **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-201010-010 has a long-term range trend plot location that may be impacted in the future. At the lease stage there are no impacts to the trend plots.

### 4.12.2 Mitigation – None

## **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 the 2008 SSS RMPA, no new leasing is allowed in the Core Management Area and occupied habitat within the Primary Population Area, suitable habitat within the Primary Population Area, and occupied habitat within the Sparse and Scattered Population Area. The parcels that lie within these categories are not 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

## **4.15 Wildlife**

### 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 Juniper Green from the Standard 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

There are about 4,500 wells in the Roswell Field Office. Federal wells are approximately 40 percent (1,800) of this total.

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
- **Total Surface disturbance: 9 acres**

Cumulative Impact Table (Based on Full Field Development)

Parcel	Comments	Parcel	40-acre	160-acre	320-acre
		Acreage	Spacing	Spacing	Spacing
<b><u>NM-201101-012</u></b>	<u>Lease with the following Stipulations:</u> NM-11-LN Special Cultural Resource SENM- S-22 Prairie Chickens	160	36	9	0
<b><u>NM-201101-013</u></b>	<u>Lease with the following Stipulations:</u>	160.16	36	9	0

	NM-11-LN Special Cultural Resource SENM- S-22 Prairie Chickens				
<b><u>NM-201101-014</u></b>	<u>Lease with the following Stipulations:</u> NM-11-LN Special Cultural Resource SENM- S-22 Prairie Chickens	157.30	36	9	0
<b><u>NM-201101-015</u></b>	<u>Lease with the following Stipulations:</u> NM-11-LN Special Cultural Resource SENM- S-22 Prairie Chickens	320	72	18	9
<b><u>NM-201101-027</u></b>	<u>Lease with the following Stipulations:</u> NM-11-LN Special Cultural Resource SENM-S-48 Paleontology	152.34	36	9	0
<b><u>NM-201101-029</u></b>	<u>Lease with the following Stipulations:</u> NM-11-LN Special Cultural Resource SENM-S-48 Paleontology SENM-S-19 Playas and Alkali Lakes Sec. 30 SWSW Sec. 31 SWNE, NENW SENM-S-20 Springs, Seeps, and Tanks Sec. 18 SWSE, SESE Sec. 30 SWSW Sec. 31 SENE	1004.52	225	54	27
<b><u>NM-201101-031</u></b>	<u>Lease with the following Stipulations:</u> NM-11-LN Special Cultural Resource SENM-S-48 Paleontology	40	9	0	0
Total		1,994.32	450	108	36

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.

#### **4.20.1 Climate Change**

This section incorporates an analysis of the contributions of the proposed action to GHG emissions and a general discussion of potential impacts to climate. The EPA's Inventory of US Greenhouse Gas Emissions and Sinks found that in 2007, total U.S. GHG emissions were over 7 billion metric tons and that total U.S. GHG emissions have increased by 17% from 1990 to 2007. Emissions increased from 2006 to 2007 by 1.4 percent (99.0 Tg. CO<sub>2</sub>e). The following factors

were primary contributors to this increase: (1) cooler winter and warmer summer conditions in 2007 than in 2006 increased the demand for heating fuels and contributed to the increase in the demand for electricity, (2) increased consumption of fossil fuels to generate electricity and (3) a significant decrease (14.2 percent) in hydropower generation used to meet this demand (EPA 2009).

On-going scientific research has identified the potential effects of anthropogenic GHG emissions such as carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and several trace gasses; changes in biological carbon sequestration; and other changes due to land management activities 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 natural GHG atmospheric concentration 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.

Analysis of cumulative impacts for reasonably foreseeable development (RFD) of oil and gas wells on public lands in the Farmington Field Office was presented in the 2003 Resource Management Plan (RMP). 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.

This incremental contribution to global GHG gases cannot be translated into effects on climate change globally or in the area of this site-specific action. As oil and gas production technology continues to improve, and because of the potential development of future regulation or legislation, one assumption is that reductions in the rate or total quantity of GHG emissions associated with oil and gas production are likely. As stated in the direct/indirect effects section under climate change, the assessment of GHG emissions and the resulting impacts on climate is an ongoing scientific process. It is currently not feasible to know with certainty the net impacts from the proposed action on global or regional climate—that is, while BLM actions may contribute to the climate change phenomenon, the specific effects of those actions on global climate are speculative given the current state of the science. Therefore, the BLM does not have the ability to associate an action's contribution in a localized area to impacts on global climate change. Further, an IPCC assessment states that difficulties remain in attributing observed temperature changes at smaller than continental scales. 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.

Currently, global climate models are inadequate to forecast local or regional effects on resources (USFS, 2008). However, there are general projections regarding potential impacts to natural resources and plant and animal species that may be attributed to climate change from GHG emissions over time; however these effects 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 (USFS, March 2008).

The New Mexico Greenhouse Gas Inventory and Reference Case Projection 1990-2020 (Inventory) estimates that approximately 17.3 million metric tons of GHGs from the natural gas industry and 2.3 million metric tons of GHGs from the oil industry are projected in 2010 as a result of oil and natural gas production, processing, transmission and distribution. As of 2008, there were 23,196 oil wells and 27, 778 gas wells in New Mexico (NM well statistics).<sup>1</sup>

When compared to the total GHG emission estimates from the total number of oil and gas wells in the State, the average number of oil and gas wells drilled annually in the Field Office and associated GHG emission levels, represent an incremental contribution to the total regional and global GHG emission levels. The number of oil and gas wells that would eventually result from the proposed action would therefore likely represent an even smaller incremental contribution to GHGs emissions on a global scale.

## **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

Glen Garnand, Environmental Protection Specialist

Jared Reese, Natural Resource Specialist

Ernest Jaquez, Natural Resource Specialist

Al Collar, Geologist

Helen Miller, Rangeland Management Specialist

Rebecca Hill, Archaeologist

Michael McGee, Hydrologist

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<sup>1</sup> In 2000, approximately 17 million metric tons and 2.3 million metric tons were respectively attributed to natural gas and oil activities. As of 2002, the Inventory indicates that there approximately 21,771 oil wells and 23,261 gas wells in the State. 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; CO2 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.

Bill Murry, Outdoor Recreation Planner  
 John Simitz, Geologist  
 Randy Howard, Wildlife Biologist  
 Dan Baggao, Wildlife Biologist  
 Angel Mayes, Assistant Field Manager - Lands & Minerals  
 Phil Watts, GIS Specialist  
 Knutt Peterson, GIS Specialist (SCEP)  
 Jerry Dutchover, Minerals  
 Howard Parman, Planning and Environmental Coordinator  
 David Glass, Petroleum Engineer  
 Tate Salas, Realty Specialist  
 Vanessa Saenz, Realty Specialist

Other Agencies

George Farmer, SE Area Habitat Specialist, New Mexico State Game and Fish  
 Thetis Gamberg, USFWS Biologist

Tribes Consulted

Apache Tribe of Oklahoma  
 Comanche Nation  
 Kiowa Tribe  
 Mescalero Apache  
 Ysleta del Sur Pueblo  
 Isleta Pueblo  
 Jicarilla Apache Nation  
 Pawnee Tribe

On October 13, 2010 a briefing was held at the New Mexico State Office with the State Director Linda Rundell, members of the Fluid Minerals team including Gloria Baca, Margie Dupre, etc., Roswell Filed office team Glen Garnand and Phil Watts.

**7.0 Public Comments**

A comment letter was received from the Center for Biological Diversity (Center) on October 26, 2010 that provided comments on parcels nominated for the January 2011 competitive oil and gas lease auction. Responses to the comments made in regards to the nominated lease parcels are provided below. Copy of the letter is available at the BLM RFO.

No.	Comment	BLM Response
1	Deferral of parcels.	RFO is deferring nine parcels. See section 2.3.
2	BLM must adhere to statutory requirements (i.e., NEPA, ESA, FLPMA).	See attached EA Sections 1.1 and 1.2
3	Species of Concern-Mountain Plover	Parcels within potentially suitable Mountain Plover habitat have been deferred for further research and analysis. See information and table in

		Section 2.3
4	GHG/Climate Change	See attached EA Section 3.1 and 4.1
5	Water Quality	See section 3.8 and 4.8

## 8.0 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.

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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.

Code of Federal Regulations (CFR): 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.

## APENDIX 1

**NM-201101-006      80.000 Acres**

T.0030S, R.0320E, 23 PM, NM

Sec. 017 E2SE;

Roosevelt County

Roswell FO

NMNM 18507

Formerly Lease No.

Stipulations:

NM -11-LN Special Cultural Resource

Recreation – OK

Visual Resources – OK

Cave/Karst - OK

SENM-S-19 – Sec. 17 NESE (SWA M. McGee)

Wildlife - Need RFO Mtn Plover

Wildlife - SENM-S-22 – Randy Howard

**Note: Mtn Plover breeding habitat using  
34<sup>th</sup> parallel and preferred  
habitat information**

**NM-201101-010      160.000 Acres**

T.0030S, R.0330E, 23 PM, NM

Sec. 029 NW;

Roosevelt County

Roswell FO

NMNM 43560

Formerly Lease No.

Stipulations:

NM -11-LN Special Cultural Resource

Recreation – OK

Visual Resources – OK

Cave/Karst - OK

Soil, Water, and Air – OK (M McGee)

Wildlife - Need RFO Mtn Plover

Wildlife - SENM-S-22 – Randy Howard

**NM-201101-011      156.120 Acres**

T.0030S, R.0330E, 23 PM, NM

Sec. 030 LOTS 3,4;

030 E2SW;

Roosevelt County

Roswell FO

NMNM 43560

Formerly Lease No.

Stipulations:

NM -11-LN Special Cultural Resource

Recreation – OK

Visual Resources – OK

Cave/Karst - OK

SENM-S-19 – Sec. 30 NESW

SENM-S-20 – Sec. 30 NESW (SWA M. McGee)

Wildlife - Need RFO Mtn Plover

Wildlife - SENM-S-22 – Randy Howard

**NM-201101-012      160.000 Acres**

T.0030S, R.0330E, 23 PM, NM

Sec. 033 SW;

Roosevelt County

Roswell FO

NMNM 54306, NMNM 056747

Formerly Lease No.

Stipulations:

NM -11-LN Special Cultural Resource

Recreation – OK

Visual Resources – OK

Cave/Karst - OK

Soil, Water and Air – OK (M. McGee)

Wildlife - SENM-S-22 – Randy Howard

Need Farm stip

**NM-201101-013      160.160 Acres**

T.0040S, R.0330E, 23 PM, NM

Sec. 004 LOTS 1,2;

004 S2NE;

Roosevelt County

Roswell FO

NMNM 70228

Formerly Lease No.

Stipulations:

NM -11-LN Special Cultural Resource

Recreation – OK

Visual Resources – OK

Cave/Karst - OK

Soil, Water and Air – OK (M. McGee)

Wildlife - SENM-S-22 – Randy Howard

Need Farm Stip

**NM-201101-014      157.300 Acres**

T.0040S, R.0330E, 23 PM, NM

Sec. 007 LOTS 3,4;

007 E2SW;

Roosevelt County

Roswell FO

NMNM 43560

Formerly Lease No.

Stipulations:

NM -11-LN Special Cultural Resource

Recreation – OK

Visual Resources – OK

Cave/Karst - OK

Soil, Water and Air – OK (M. McGee)

Wildlife - SENM-S-22 – Randy Howard

**NM-201101-015      320.000 Acres**

T.0040S, R.0330E, 23 PM, NM

Sec. 014 S2;

Roosevelt County

Roswell FO

NMNM 65654

Formerly Lease No.

Stipulations:

NM -11-LN Special Cultural Resource

Recreation – OK

Visual Resources – OK

Cave/Karst - OK

Soil, Water and Air – OK (M. McGee)

Wildlife - SENM-S-22 – Randy Howard

**NM-201101-019      160.000 Acres**

T.0080S, R.0350E, 23 PM, NM

Sec. 033 SW;

Roosevelt County

Roswell FO

NMNM 194665, NMNM 004039-D

Formerly Lease No.

Stipulations:

**Wildlife – RMPA PPA Pull**

**NM-201101-020      80.000 Acres**

T.0080S, R.0350E, 23 PM, NM

Sec. 034 S2NW;

Roosevelt County

Roswell FO

NMNM 77100

Formerly Lease No.

Stipulations:

**Wildlife – RMPA PPA Pull**

**NM-201101-026      317.490 Acres**

T.0080S, R.0370E, 23 PM, NM

Sec. 030 LOTS 1,2;

030 NE,E2NW;

Roosevelt County

Roswell FO

NMNM 003431

Formerly Lease No.

Stipulations:

**Wildlife – RMPA PPA Pull**

**NEW MEXICO PUBLIC DOMAIN-NE**

**NM-201101-027      152.340 Acres**

T.0100N, R.0370E, 23 PM, NM

Sec. 005 LOTS 1, 3-5;

008 LOTS 1-4;

017 LOTS 1;

Quay County

Roswell FO

NMNM 64832

Formerly Lease No.

Stipulations:

NM-11-LN Special Cultural Resource

SENM-S-48 Paleontology

~~Need RFO Mtn Plover Stip~~

Recreation – OK

Visual Resources – OK

Cave/Karst - OK

Soil, Water and Air – OK (M. McGee)

Wildlife - OK

**NM-201101-028      320.230 Acres**

T.0100N, R.0370E, 23 PM, NM

Sec. 006 LOTS 4;

006 SWNW,SW,W2SE;

Quay County

Roswell FO

NMNM 64832

Formerly Lease No.

Stipulations:

NM-11-LN Special Cultural Resource

SENM-S-48 Paleontology

Recreation – OK

Visual Resources – OK

Cave/Karst - OK

SENM-S-20 – Sec. 6 N2SW (SWA M. McGee)

Wildlife - Need RFO Mtn Plover Stip SW1/4

**NM-201101-029      1004.520 Acres**

T.0100N, R.0370E, 23 PM, NM

Sec. 017 LOTS 4;

017 SWSW;

018 S2S2;

019 NENE;

020 LOTS 1-4;

020 NWNW;

029 LOTS 1-4;

029 SWSW;

030 S2S2;

031 N2,NESE;

Quay County

Roswell FO

NMNM 64832

Formerly Lease No.

Stipulations:

NM-11-LN Special Cultural Resource

SENM-S-48

~~Need RFO New Mtn Plover Stip~~

Recreation – OK

Visual Resources – OK

Cave/Karst - OK

SENM-S-19 – Sec. 30 SWSW

Sec. 31 SWNE, NENW

SENM-S-20 – Sec. 18 SWSE, SESE

Sec. 30 SWSW

Sec. 31 SENE (SWA M. McGee)

Wildlife - OK

**NM-201101-030      160.000 Acres**

T.0100N, R.0370E, 23 PM, NM

Sec. 018 N2N2;

Quay County

Roswell FO

NMNM 64832

Formerly Lease No.

Stipulations:

NM-11-LN Special Cultural Resource

SENM-S-48

Recreation – OK

Visual Resources – OK

Cave/Karst - OK

Soil, Water, and Air – OK (M McGee)

Wildlife - OK

**NM-201101-031      40.000 Acres**

T.0100N, R.0370E, 23 PM, NM

Sec. 030 SWNE;

Quay County

Roswell FO

NMNM 64832

Formerly Lease No.

Stipulations:

NM-11-LN Special Cultural Resource

SENM-S-48

~~Need RFO New Mtn Plover Stip~~

Recreation – OK

Visual Resources – OK

Cave/Karst - OK

Soil, Water, and Air – OK (M McGee)

Wildlife - OK