

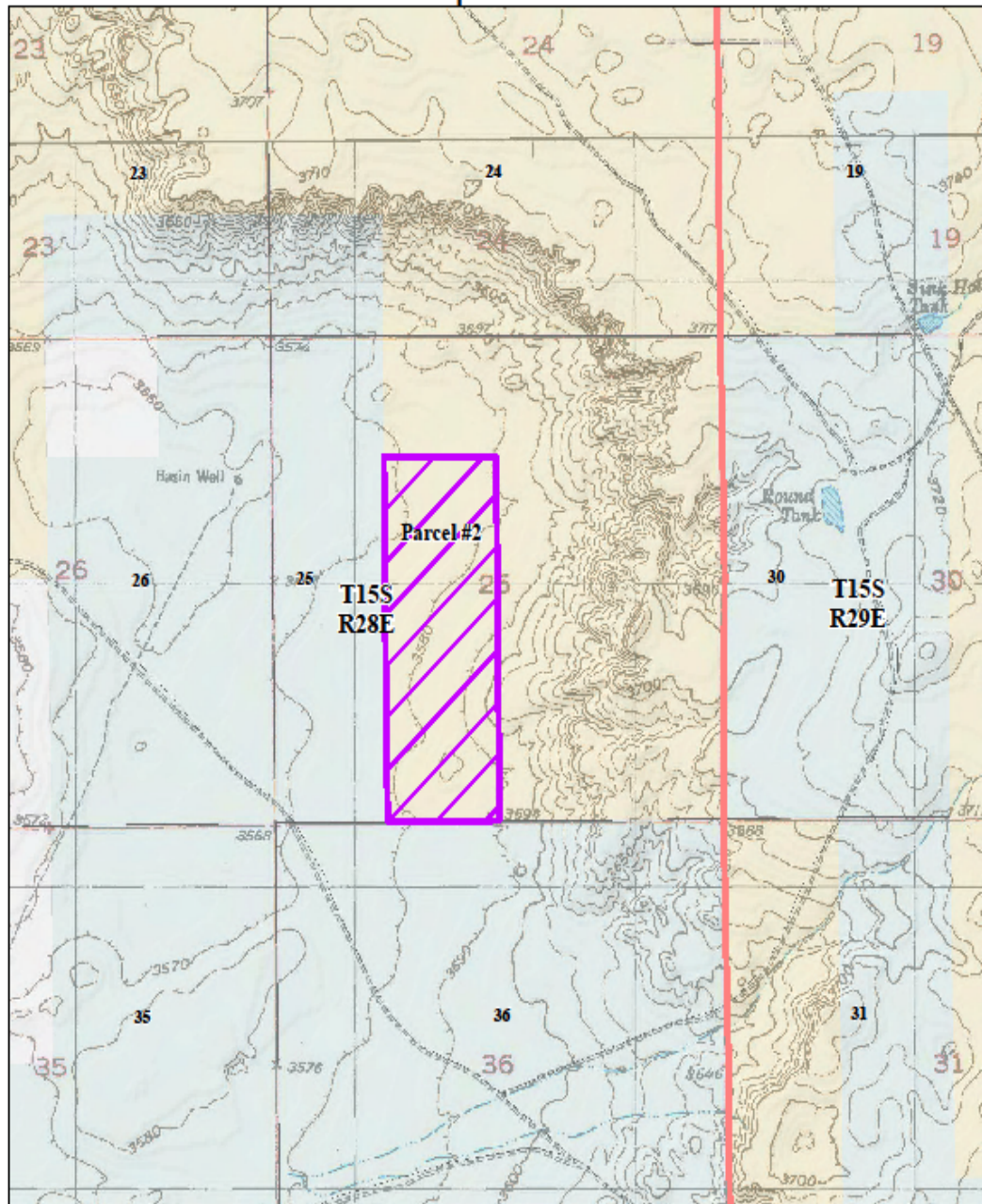
**Environmental Assessment
DOI-BLM-NM-P010-2013-63-EA**

















**April 2013 Competitive Oil and Gas Lease Sale
Lease Parcel NM-201304-002
Location: T. 15 S., R. 28 E., Sec. 25, Chaves Co., New Mexico**

**Bureau of Land Management
Pecos District, Roswell Field Office**



Roswell Field Office - April 2013 Lease Sale Parcels



 Draft Lease Parcels - April 2013	VRM Class	New Mexico State Land Exchange		  
 Area of Critical Environmental Concern	 I	 Priority 1	 Priority 1**	
 Special Status Species - LUPA	 II	 Priority 1*	 Priority 2	
 LPC Primary Population Area	 III			
 Core Management Area	 IV			

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual or aggregate use with other data. Original data were compiled from various sources and may be updated without notification.

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

Project: April 2013 Competitive Oil and Gas Lease Sale

Parcel NM-201304-002

Location: T. 15 S., R. 28 E., Sec. 25, SENW, E2SW, Chaves County, New Mexico.

EA Log Number: DOI-BLM-NM-P010-2013-63-EA

Finding of No Significant Impact

Based on the analysis of potential environmental impacts contained in the attached Environmental Assessment (EA), I have determined the Proposed Action is not expected to have significant impacts on the environment. The impacts of leasing the fluid minerals estate in the area described with this EA have been previously analyzed in the 1997 Roswell Resource Management Plan; and the lease stipulations and notices accompanying the tract proposed for leasing would mitigate the impacts of future development on these tracts. Therefore, preparation of an Environmental Impact Statement is not warranted.

Prepared by:

Beth Skaggs, Natural Resources Specialist

Date

Reviewed By:

Angel Mayes, Assistant Field Manager – Land and Minerals

Date

Charles Schmidt, Roswell Field Office Manager

Date

Approved By:

Jesse Juen, State Director

Date

**DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
ROSWELL FIELD OFFICE
Environmental Assessment for April 2013
Competitive Oil and Gas Lease Sale
DOI-BLM-NM-P010-2013-63-EA**

CHAPTER ONE INTRODUCTION

It is the policy of the Bureau of Land Management (BLM) as derived from various laws, including the Mineral Leasing Act of 1920 (MLA), as amended [30 U.S.C. 181 *et seq.*], and the Federal Land Policy and Management Act of 1976 (FLPMA), 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 (NCLS), which lists lease parcels to be offered at the auction, is published by the NMSO at least 90 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 are 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 the BLM in consultation with the appropriate surface management agency or the private surface owner.

In the process of preparing a lease sale the NMSO sends a draft parcel list to any Field Offices in which 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 new information has become available which might change any analysis conducted during the planning process; if appropriate consultations have been conducted; what appropriate stipulations should be included; and if there are special resource conditions of which potential bidders should be made aware. The parcels nominated for this sale, along with the appropriate stipulations from the 1997 Roswell Resource Management Plan (RMP) and subsequent amendments, are posted online for a two week public scoping period. Comments received are reviewed and incorporated into the Environmental Assessment (EA).

Once the draft parcel review is completed and returned to the NMSO, a list of nominated lease parcels with specific, applicable stipulations is made available online to the public through the NCLS. On rare occasions, additional information obtained after the publication of the NCLS may result in deferral of certain parcels prior to the lease sale.

This EA documents the Roswell Field Office (RFO) review of the one parcel nominated for the April 2013 Competitive Oil and Gas Lease Sale that are under the administration of the RFO. It serves to verify conformance with the approved land use plan, 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.

The parcel and applicable stipulations were posted online for a two-week public scoping period between 29 October and 13 November 2012. No comments were received. In addition, this EA was made available for public review and comment for 30 days beginning December 3, 2012. No comments were received..

1.0 Purpose and Need

The purpose is to consider opportunities for private individuals or companies to explore for and develop oil and gas resources on public lands through a competitive leasing process.

The need of the action is established by the BLM's responsibility under the MLA, as amended, to promote the exploration for oil and gas on the public domain. The MLA also establishes that deposits of oil and gas owned by the United States are subject to disposition in the form and manner provided by the MLA under the rules and regulations prescribed by the Secretary of the Interior, where consistent with the FLPMA, the National Environmental Policy Act (NEPA) of 1969, as amended (Public Law 91-90, 42 USC 4321 et seq.), and other applicable laws, regulations, and policies. The BLM will decide whether or not to lease the nominated parcels for lease and, if so, under what terms and conditions.

1.1 Conformance - Applicable Land Use Plan, Other Environmental Assessments

The applicable land use plan for this action is the 1997 Roswell Resource Management Plan (RMP). 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 also describes specific stipulations that would be attached to new leases offered in certain areas. Therefore, it is determined that the alternatives considered conform to fluid mineral leasing decisions in the 1997 Roswell RMP and are consistent with the goals and objectives for natural and cultural resources.

Pursuant to 40 Code of Federal Regulations (CFR) 1508.28 and 1502.21, this EA is tiered to and incorporates by reference the information and analysis contained in the 1997 Roswell RMP Final Environmental Impact Statement. While it is unknown precisely when, where, or to what extent well sites or roads would be proposed, the analysis of projected surface disturbance impacts, should a lease be developed, is based on potential well densities listed in the Reasonable Foreseeable Development (RFD) Scenario included in the RMP. While an appropriate level of site-specific analysis of individual wells or roads would occur when a lease holder submits an Application for Permit to Drill (APD), assumptions based on the RFD scenario may be used in the analysis of impacts in this EA.

FLPMA established guidelines to provide for the management, protection, development, and enhancement of public lands (Public Law 94-579). Section 103(e) of FLPMA defines public lands as any lands and interest in lands owned by the U.S. For split-estate lands where the mineral estate is an interest owned by the U.S., the BLM has no authority over use of the surface by the surface owner; however, the BLM is required to declare how the federal mineral estate will be managed in the RMP including identification of all appropriate lease stipulations (43 CFR 3101.1 and 43 CFR 1601.0-7(b); BLM Manual Handbook 1601.09 and 1624-1).

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.

RFO biologists reviewed the proposed action and determined it would be in compliance with threatened and endangered species management guidelines. No further consultation with the U.S. Fish and Wildlife Service (USFWS) is required at this stage.

Federal regulations and policies require the BLM to make its public land and resources available on the basis of the principle of multiple-use. At the same time, it is BLM policy to conserve special status species and their habitats, and to ensure that actions authorized by the BLM do not contribute to the need for the species to become listed as threatened or endangered by the USFWS.

Compliance with National Historic Preservation Act (NHPA) Section 106 responsibilities are adhered to by following the Protocol Agreement between New Mexico BLM and New Mexico State Historic Preservation Officer (Protocol Agreement), 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. When draft parcel locations are received by RFO, cultural resource staff reviews the locations to determine if any are within known areas of concern.

Native American consultation is conducted by certified mail regarding each lease sale activity. If Traditional Cultural Properties (TCP) or heritage-related issues are identified, such parcels are withheld from the sale while letters requesting information, comments, or concerns are sent to the Native American representative. If the same draft parcels appear in a future sale, a second request for information is sent to the same recipients and the parcels will be held back again. If no response to the second letter is received, the parcels are allowed to be offered in the next sale.

If responses are received, BLM cultural resources staff will discuss the information or issues of concern with the Native American representative to determine if all or portions of a parcel need to be withdrawn from the sale, or if stipulations need to be attached as lease stipulations. Native American consultation letters were sent out for the April 2013 Lease Sale.

In Section 1835 of the Energy Policy Act of 2005 (43 U.S.C. 15801), Congress directed the Secretary of the Interior to review current policies and practices with respect to management of federal subsurface oil and gas development activities and their effects on the privately owned surface. The Split Estate Report, submitted in December 2006, documents the findings from consultation on the split estate issue with affected private surface owners, the oil and gas industry, and other interested parties.

In 2007, the Legislature of the State of New Mexico passed the Surface Owners Protection Act. This Act requires operators to provide notice to the surface owner, at least five business days prior to initial entry upon the land for activities that do not disturb the surface; and provide notice at least 30 days prior to conducting actual oil and gas operations. At the New Mexico Federal Competitive Oil and Gas Lease Sale conducted on October 17, 2007, the BLM announced the implementation of this policy. Included in this policy is the implementation of a Notice to Lessees (NTL), a requirement of lessees and operators of onshore federal oil and gas leases within the State of New Mexico to provide the BLM with the names and addresses of the surface owners of those lands where the Federal Government is not the surface owner, not including lands where another federal agency manages the surface.

The BLM NMSO would then contact the surface owners and notify them of the expression of interest and the date the oil and gas rights would be offered for competitive bidding. The BLM would provide the surface owners with its website address so they may obtain additional information related to the oil and gas leasing process, the imposition of any stipulations on that lease parcel, federal and state regulations, and best management practices (BMPs). The surface owners may elect to protest the leasing of the minerals underlying their surface.

If the BLM receives a protest, the parcel would remain on the lease sale; however, the BLM would resolve any protest prior to issuing an oil and gas lease for that parcel. If the protest is upheld, the BLM would return the payments received from the successful bidder for that parcel. After the lease sale has occurred, the BLM would post the results on its website and the surface owner may access the website to learn the results of the lease sale.

1.3 Identification of Issues

An initial internal review of the Proposed Action was conducted by an interdisciplinary team (IDT) of RFO resource specialists on 10 and 17 October 2012, to identify and consider potentially affected resources and associated issues. During the meeting, and in later discussions, the IDT addressed stipulations needed to protect resources.

Following the onsite visit, and review of RMP and other data sources, the IDT determined the following elements to not be present: Areas of Critical Environmental Concern, Prime or Unique Farmlands, Floodplains, Wild and Scenic Rivers, Threatened and Endangered Species, Wetlands/Riparian Zones, Wilderness or Wilderness Study Areas, Wild Horses and Burros.

No surface cave/karst features were observed in the immediate vicinity of the proposed actions. The proposed lease is located in Low Karst Potential Areas. Cave/Karst is not be further analyzed. In addition there are no Right-of-Way grants within the lease sale parcel.

Construction materials (caliche/gravel) for developing the nominated parcel could be obtained by the operator from abandoned oil and gas pads and roads that may currently exist on the nominated parcel, or from a federal pit identified by a BLM authorized offer. A permit is required prior to any removal of any Federal mineral material.

The parcel included in the Proposed Action, along with the appropriate stipulations from the RMP, were posted online for a two-week public scoping period beginning 29 October to 13 November 2012 at this website: http://www.blm.gov/nm/st/en/prog/energy/oil_and_gas/oil_and_gas_lease.html No comments were received.

CHAPTER TWO PROPOSED ACTIONS AND ALTERNATIVES

2.0 Alternatives Including the Proposed Action

2.1 Alternative A - No Action Alternative

The BLM NEPA Handbook (H-1790-1) states that for EAs on externally initiated proposed actions, the No Action Alternative generally means the proposed action would not take place. In the case of a lease sale, this would mean an expression of interest to lease (parcel nomination) would be denied or rejected, and the parcel(s) would not be offered for lease during the April 2013 Competitive Oil and Gas Lease Sale. Surface management and any ongoing oil and gas development on surrounding federal, private, and state leases would continue under current guidelines and practices. Selection of the No Action Alternative would not preclude this parcel from being nominated and considered in a future lease sale.

2.2 Alternative B – Proposed Action

The Proposed Action is to lease the one parcel of federal minerals nominated by the public, covering 120.00 acres administered by the RFO, for oil and gas exploration and development. Standard terms and conditions as well as stipulations (as required by Title 43 CFR 3101.1-3) listed in the RMP would apply as appropriate to a lease. In addition, site specific mitigation measures and BMPs would be attached as Conditions of Approval (COAs) for each proposed exploration and development activity authorized on a lease. A complete description of this parcel, including any stipulations, is provided in Appendix 1 and the table below. The parcel contains a Special Cultural Resources Lease Notice stating all development activities proposed under the authority of the lease is subject to compliances with Section 106 of the NHPA and Executive Order (EO) 13007. Once sold, the lease purchaser has the exclusive right to use so much of the leased lands as is necessary to explore and drill for 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 ten (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, exclusive right to develop the leasehold reverts back to the federal government and the lease can be reoffered in another sale.

Drilling of wells on a lease would not be permitted until the lease owner or operator meets the site specific requirements specified in 43 CFR 3162. A permit to drill would not be authorized until site-specific NEPA analyses were conducted. The Proposed Action parcel recommended for leasing, with stipulations, is presented below.

Proposed Action Alternative		
Parcel	Stipulations	Acres
<u>NM-201304-002</u> T. 0150S, R. 0280E, NM PM, Sec. 025 SENW, E2SW; Chaves County Roswell Field Office	<u>Lease with the following Stipulations</u> NM-11-LN Special Cultural Resources SENM-S-39 Plan of Development	120.00

CHAPTER THREE AFFECTED ENVIRONMENT

3.0 Introduction

This section describes the environment that would be affected by implementation of the alternatives described in Section 2. Elements of the affected environment described in this section focus on the relevant resources and issues. Only those elements of the affected environment that have potential to be significantly impacted are described in detail.

3.1 Air Quality

The state of New Mexico has divided the state into 12 air quality regions. The Roswell Field Office planning area lies in region 155 (New Mexico Environment Department--Air Quality Bureau, 2010). The Pecos-Permian Basin Intrastate Air Quality Control Region 155 (AQCR 155) is composed of Quay, Curry, De Baca, Roosevelt, Chaves, Lea, and Eddy Counties. Generally, it includes the areas known as the Southern High Plains and the Middle Pecos River drainage basin (New Mexico Environment Department--Air Quality Bureau, 2010).

The Environmental Protection Agency (EPA) has the primary responsibility for regulating air quality nationwide, including six "criteria" air pollutants. These criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM₁₀ & PM_{2.5}), sulfur dioxide (SO₂) and lead (Pb). EPA has established National Ambient Air Quality Standards (NAAQS) for criteria pollutants. The NAAQS are protective of human health and the environment. EPA has approved New Mexico's State Implementation Plan and the state enforces state and federal air quality regulations on all public and private lands within the state, except for tribal lands and within Bernalillo County. The Roswell area attains all national ambient air quality standards.

The area of the analysis is considered a Class II air quality area by the EPA. There are three classifications of areas that attain national ambient air quality standards, Class I, Class II and Class III. Congress established certain national parks and wilderness areas as mandatory Class I areas where only a small amount of air quality degradation is allowed. All other areas of the US are designated as Class II, which allow a moderate amount of air quality degradation. No areas of the US have been designated Class III, which would allow more air quality degradation. The primary sources of air pollution are dust from blowing wind on disturbed or exposed soil, exhaust emissions from motorized equipment, oil and gas development, agriculture, and industrial sources.

Air quality in a given region can be measured by its Air Quality Index value. The air quality index (AQI) is reported according to a 500-point scale for each of the major criteria air pollutants, with the worst denominator determining the ranking. For example, if an area has a CO value of 132 on a given day and all other pollutants are below 50, the AQI for that day would be 132. The AQI scale breaks down into six categories: good (AQI<50), moderate (50-100), unhealthy for sensitive groups (100-150), unhealthy (>150), very unhealthy and hazardous. The AQI is a national index, the air quality rating and the associated level of health concern is the same everywhere in the country. The AQI is an important indicator for populations sensitive to air quality changes.

Current Pollution concentrations

AQCR 155 is classified as an attainment area for all criteria pollutants, indicating that the area satisfies all NAAQS. There is no monitoring conducted for lead and carbon monoxide in southeastern New Mexico; however concentrations of these pollutants are expected to be low in rural areas and are therefore not monitored. The New Mexico Environment Department discontinued monitoring for SO₂ in Eddy County due to very low monitored concentrations. Monitoring data for PM₁₀ and PM_{2.5} in southeastern New Mexico are not available due to incomplete data collection.

“Design Concentrations” are the concentrations of air pollution at a specific monitoring site that can be compared to the NAAQS. The 2011 design concentrations of criteria pollutants are listed below.

Figure 1. 2011 Design Concentrations of Criteria pollutants in southeastern NM (EPA, 2012)

Pollutant	Design Value	Averaging period	NAAQS	NMAAQS
O ₃	0.069 ppm (Lea County)	8-hour	0.075 ppm ¹	
	0.061 ppm (Eddy County)			
NO ₂	6 ppb (Lea County)	Annual	53 ppb	50 ppb
	3 ppb (Eddy County)			
NO ₂	42 ppb	1-hour	100 ppb ²	

¹ Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years

²98th percentile, averaged over 3 years

Mean AQI values for the Roswell area were generally in the good range (AQI<50) in 2011. In Chaves County, 95% of the days in 2011 were classified as “good”. The median AQI in Chaves County was 20 or “good” and the maximum AQI was 71 or “moderate” during 2011. In the past decade, there was only 1 day in 2003 that reached the level of “unhealthy for sensitive groups” (EPA, 2012a).

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

3.2 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). The following table summarizes components of climate that could affect air quality in the region.

Climate Component	Temperature
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 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 (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). CO₂ and methane (CH₄) 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 CO₂; CH₄; nitrous oxide (N₂O); 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 CO₂ concentrations to increase dramatically, and are likely to contribute to overall climatic changes. Increasing CO₂ concentrations may 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 are 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 proposed lease parcels 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 (IPCC, 2007, CCSP, 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, 2008).

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.

3.3 Heritage Resources

3.3.1 Cultural 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.

The project falls within the Southeastern New Mexico Archaeological Region. This region contains the following cultural/temporal periods: Paleoindian (ca. 12,000 - 8,999 B.C.), Archaic (ca. 8000 B.C. – A.D. 950), Ceramic (ca. A.D. 600 – 1540), Protohistoric and Spanish Colonial (ca. A.D. 1400 – 1821), and Mexican and American Historical (ca. A.D. 1822 – early 20th century). Sites representing any or all of these periods are known to occur within the region. A more complete discussion can be found in *Living on the Land: 11,000 Years of Human Adaptation in Southeastern New Mexico, An Overview of Cultural Resources in the Roswell District*, Bureau of Land Management, published in 1989 by the U.S. Department of the Interior, Bureau of Land Management. A cultural resource inventory shall be conducted of the affected area for the proposed project prior to any ground disturbing activities.

3.3.2 Native American Religious Concerns

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

Native American communities are most likely to identify TCPs, although TCPs are not restricted to those associations. Some TCPs are well known, while others may only be known to a small group of traditional practitioners, or otherwise only vaguely known. A review of existing information indicates the proposed actions are outside any known TCP.

3.3.3 Paleontological Resources

The parcel in this lease sale may contain paleontological resources. The BLM uses the Potential Fossil Yield Classification (PFYC) system to identify areas with a high potential to produce significant fossil resource (IM 2008-009). Management concern for paleontological resources on this parcel (NM-201304-002, Class 2) is negligible. Ground disturbing activities will not require mitigation except in rare circumstances.

3.4 Water Resources

3.4.1 Water Quality – Surface and 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.

The surface is covered by Quaternary alluviums of sand, silt, clay and some gravel. Some of the Quaternary Alluviums are thin deposits of windblown sand and silt. Some groundwater is obtained from the Triassic aged sandstones found in the Chinle and Santa Rosa formations both of which contribute to

the supply of domestic and stock water. Groundwater is generally fair to saline. In areas sulfate is high but generally satisfactory for stock and irrigation. Groundwater in the vicinity of the northern parcel occurs in the 600 to 700 ft. range of the Yeso formation. All other groundwater occurs in an approximate range of 50 to 500 + ft., primarily in the Chinle formation.

3.4.2 Watershed - Hydrology

The proposed lease parcel NM-201304-002 is located within the Upper Pecos Long Arroyo 8-digit hydrologic unit code 13060007 watershed.

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 power lines.

3.5 Soil

The Soil Conservation Service, now the Natural Resource Conservation Service (NRCS), has surveyed the soils in Chaves County. Complete soil information is available in the Soil Survey of Chaves County, New Mexico, Southern Part (USDA Soil Conservation Service 1980) and online at <http://websoilsurvey.nrcs.usda.gov/app/>. Most of the parcel is in Pajarito-Pintura complex soils. The soil map units represented in the project area are below.

Parcel	Soils
<p>Parcel NM-201304-002 120.000 acres T. 00150S., R. 0280E, NM PM, Sec. 025, SENW, E2SW Chaves County Roswell Field Office</p>	<p>(Aa) Alama loam. Swales and flood plains; convex shape; calcareous alluvium derived from sedimentary rock; 0 to 3 percent slopes ; well drained, more than 80 inches depth to water table. Profile is loam, clay loam, silt loam.</p> <p>(Pb) Pajarito-Pintura complex. Pajarito: alluvial fans, terraces, plains; linear, convex shape; mixed alluvium and/or aeolian deposits derived from sedimentary rock; 1 to 3 percent slopes; well drained, more than 80 inches depth to water table; Loamy ecological site; Profile is fine sandy loam throughout.</p> <p>Pintura: Dunes, convex shape; mixed aeolian deposits derived from sedimentary rock; slope 3 to 15 percent; excessively drained, more than 80 inches depth to water table. Sandy ecological site; Profile is loamy fine sand to Fine sand throughout.</p> <p>(So) Sotim fine sandy loam. Alluvial fans, plains; shape linear, convex, parent material mixed alluvium and/or Aeolian deposits derived from sedimentary rock; 0 to 3 percent slope; more than 80 inches depth to water table; Sandy ecological</p>

	site; Profile is fine sandy loam, clay loam.
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3.6 Vegetation

The parcel is included in portions of the following Plant Community: Grassland Community.

The primary consideration in listing range sites under this community type is the flat to moderately rolling topography with 75 percent and higher composition of grasses in the description of potential plant community.

Grassland is the climax vegetative aspect for large portions of the resource area. The grassland community type is the most widespread. It can be further subdivided into grass rolling upland, grass hill, grass flat, and mesquite grassland subtypes, depending on topographic relief or seral stage. In many areas the subtypes may overlap. For the purpose of the RMP, the subtypes are grouped into the grassland community type. Vegetation is primarily dominated by warm season short and midgrasses. Large areas of grassland climax communities have dropped in successional stage due to misuse and have become a dis climax mixed shrub community.

The grass rolling uplands is the predominant shortgrass habitat subtype in the resource area. It is found on broad, nearly level or gently undulating plains to rolling hills at elevations between 3800 feet to 5000 feet. Slopes are 0 to 9 percent. Vegetation is dominated by blue grama, black grama, galleta, tobosa, sideoats grama, dropseeds, muhlys, threeawns, burrograss and fluffgrass.

Woody shrub species are scarce but include mesquite, fourwing saltbush, wolfberry, sumac, and cactus species such as yucca and cholla. Invasions of broom snakeweed, a halfshrub, is common in some areas. Forbs are a minor component of the subtype except following periods of rainfall. Ground cover may be too sparse in much of this subtype to provide the cover requirements of certain small mammals or ground nesting birds.

Grass hills are found primarily on hills, low mountains, or lower foot slopes of higher mountains. Slopes are rolling to steep and average about 25 percent. Elevations range from 4500 feet to 6000 feet. Short and mid grasses dominate this subtype, including hairy grama, fluffgrass, three awn, and red lovegrass. Shrubs, halfshrubs and cacti include little leaf sumac, beargrass, ocotillo, hedgehog cactus, cholla and broom snakeweed. The structured diversity of the vegetation in this subtype provides more diverse bird nesting habitat than adjacent grasslands. This is the preferred habitat for mule deer, which also use the brushy draws for browse and cover.

The grass flats subtype occurs on nearly level to gently sloping upland plains as broad swales between uplands, or as isolated pockets in shallow depressions, playas, along drainages or in sinks. These areas receive significant runoff from adjacent sites, which produces more dense and taller vegetation. Vegetation is dominated by mid and tall grasses with occasional shrubs or half shrubs. The primary grasses are tobosa and galleta, which may occur on large expanses between upland sites, and alkali and giant sacaton, which usually are found along drainages or in depressions. Shrubs sparsely associated with the sacaton type are mesquite and fourwing saltbush. A few scattered yuccas or cholla may be interspersed in the tobosa swales. Forb diversity and abundance is low due to the density of the grass cover.

The mesquite grassland type could best be described as a dis climax stage in a desert shortgrass climax. The mesquite invasion results from disturbance of natural successional processes. The type is generally located between the grassy plains and the Pecos River, including the breaks adjacent to the floodplain.

Terrain is level to gently undulating with slopes generally less than 5 percent, or hummocky with numerous sand dunes scattered throughout the area. The elevation varies from 3,000 feet to 6,000 feet.

Mesquite is found on most soil types, but the main invasion occurs on sandy soils. The predominant shrub is honey mesquite, which has invaded what at one time was a shortgrass dominated type. Few other shrub species are associated with mesquite, although some creosote, yucca and Opuntia occur. Vegetation is dominated by black gama, blue grama, dropseed, muhly, tobosa and galleta, fluffgrass, and alkali sacaton on undulating terrain, with higher percentages of dropseed, three awn and muhly on sandy sites. Halfshrubs include sand sage and broom snakeweed. Forbs may be abundant following periods of rainfall. Grasslands is the most widespread of the community types found in the resource area. Approximately 30 percent (149) of the wildlife species found in the resource area use this community type.

The Ecological Site Description for the proposed parcel is Sandy SD-3.

3.7 Invasive, Non-native Species and Noxious Weeds

Once the decision is made to develop a lease area, a specific Invasive and Nonnative 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 Nonnative species (Weed) inventory would be required. While there are no known populations of invasive or non-native species on the proposed parcel, 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.

3.8 Special Status Species

3.8.1 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. There are no threatened or endangered species that occur within the listed parcel.

3.8.2 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 the species 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. No Special Status Species are expected to occur in the proposed project area.

3.9 Wildlife

The entire area provides myriad habitat types for terrestrial wildlife species. The diversity and abundance of wildlife species in the area is due to a mixture of grassland habitat and mixed desert shrub vegetation.

Common bird species are mourning dove, scaled quail, 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. Resident bats in the area are Townsend's Western Big-eared (*Coryhinorinus townsendii*), Cave Bat (*Myotis velifer*) and Small-footed Bat (*Myotis celiolabrum*). None of these bat species are threatened or endangered.

A variety of reptiles 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.

3.10 Livestock Grazing

The proposed lease sale area is contained within the Turkey Track allotment, 65075, within the North Middle Pasture. This allotment is authorized at 4,587 Animal Units/ 28,623 Animal Unit Months. The allotment contains 230,061 acres of public surface, 99,295 acres of state lease and 64,888 acres of private land. The southern pasture fence line lies across the south end of the proposed lease area.

3.11 Visual Resources

The nominated lease parcel is located in an area designated Visual Resource Management (VRM) Class IV. VRM on public lands is conducted in accordance with BLM Handbook 8410 and BLM Manual 8411. Visual elements analyzed:

Form – flat to slightly undulating

Line – horizontal

Color – Reddish sand and patches of olive drab-colored vegetation. In the warm months vegetative color ranges from olive drab to grey-green and during cold months without foliage, vegetative color is grey.

Texture – smooth to medium

3.12 Recreation

The recreational use of the lease area is primarily by visitors engaged in hunting.

3.13 Socioeconomics and Environmental Justice

Executive Order 12898, issued on 11 February 1994, addresses concerns over disproportionate environmental and human health impacts on minority and low-income populations. The impetus behind environmental justice is to ensure that all communities, including minority, low-income, or federally recognized tribes, live in a safe and healthful environment. The April 2013 Oil and Gas Lease Sale will be in conformance with this executive order.

CHAPTER FOUR ENVIRONMENTAL IMPACTS

4.0 Environmental Consequences

4.1 Assumptions for Analysis

The act of leasing 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 within five years; long-term impacts are those that would substantially remain for more than five years. Potential impacts 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.

4.2 Effects from the No Action Alternative

Under the No Action Alternative, the proposed parcel(s) would not be leased. There would be no subsequent impacts from oil and/or gas construction, drilling, and production activities. 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 leasing and potential development of those minerals, the assumption is the public's demand for the resource would not be expected to change. Instead, the undeveloped resource 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.

4.3 Analysis of Action Alternatives

4.3.1 Air Quality Impacts from Action Alternatives

Leasing the subject tract would have no direct impacts to air quality. Any potential effects to air quality from sale of a lease parcel would occur at such time that the lease was 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 lease 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.

The most significant criteria pollutants emitted by oil and gas development and production are VOCs, particulate matter and NO₂. VOCs and NO_x contribute to the formation of ozone, which is the pollutant of most concern in southeastern New Mexico. The additional NO_x and VOCs emitted from any new oil and gas development on this lease is likely too small to have a significant effect on the overall ozone levels of the area.

Potential Mitigation:

The BLM encourages industry to incorporate and implement 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 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.

4.3.2 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 science 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 the following table for the US, New Mexico and for wells on federal leases in each basin.

2010 Oil and Gas Production

Location	Oil (bbl)	% U.S. Total	Gas (MMcf)	% U.S. Total
United States	1,999,731,000	100	26,836,353	100
New Mexico	65,380,000	3.27	1,341,475	5.00
Federal leases in New Mexico	31,533,000	1.58	824,665	3.07
Federal leases in San Juan Basin	1,468,000	0.07	630,060	2.35
Federal leases in Permian Basin	30,065,000	1.5	194,065	0.73

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's *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990- 2010* (EPA, 2012b), 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 BLM, and allow for comparison with other sources in a broad sense.

2010 Oil and Gas Field Production Potential Emissions

Location	Oil (Metric tons of CO ₂ ^e)		Gas (Metric tons of CO ₂ ^e)		Total O&G Production (Metric tons CO ₂ e)	%U.S. Total GHG emissions
	CO ₂	CH ₄	CO ₂	CH ₄		
United States	300,000	30,600,000	10,800,000	126,000,000	167,700,000	2.6
New Mexico	9,810	1,000,620	540,000	6,300,000	7,850,430	0.12
Federal leases in New Mexico	4,740	483,480	331,560	3,868,200	4,687,980	0.07
Federal leases in San Juan Basin	210	21,420	253,800	2,961,000	3,236,430	0.05
Federal leases in Permian Basin	4,500	459,000	78,840	919,800	1,462,140	0.03

The table above shows 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. The estimates are only for operations, not for construction and reclamation of the facilities, which may have a higher portion of a project's GHG contribution. Note that units of Metric tons CO₂^e have been used in the table above to avoid very small numbers. CO₂^e is the concentration of CO₂ that would cause the same level of radiative forcing as a given type and concentration of greenhouse gas.

The table above also provides an estimate of direct emissions occur during exploration and production of oil and gas. This phase of emissions represents a small fraction of overall emissions of CO₂^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 CO₂e 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. CFO 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, then refined the search to include only Lea, Eddy, and Chavez counties (25,298), and finished the search by limiting the results to Federal wells (11,216).

**Potential Greenhouse Gas Emissions Resulting from Proposed Lease Sale
Referenced to Latest Available Estimates from 2010**

Total U.S. GHG Emissions From All Sources	6,372,900,000 metric tons	100.00 %
Total U.S. GHG Emissions From Oil & Gas Field Production	167,700,000 metric tons	2.6%
Total New Mexico Emissions From Oil & Gas Field Production	7,850,430 metric tons	.12%
Total San Juan Basin Emissions From Oil & Gas Field Production (15,811 wells)	4,384,230 metric tons	.07%
Total Permian Basin Emissions From Oil & Gas Field Production (11,216 wells)	3,175,830 metric tons	.05%
Total Potential GHG Emissions From Oil & Gas Field Production at Full Development For Proposed Action (10 Wells)	2831.5 metric tons	0.00004%

The table above estimated that the total emissions from Federal leases in the Permian in 2010 were 3,175,830 metric tons CO₂^e. Therefore, the estimate of emission per well is 283.1 metric tons CO₂^e annually (See Section 5: Cumulative Impacts for more information).

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 CO₂ and CH₄ 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: 1990-2010 (EPA, 2012b). 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. While EPA data shows that methane emissions increased from oil and gas exploration and development from 1990-2010, reductions in methane emissions from oil and gas exploration and development should occur in future years as a result of EPA's recently finalized oil and gas air emissions regulations.

4.3.3 Heritage Resources

4.3.3.1 Cultural Resources

While the act of leasing a parcel would produce no impacts, subsequent development of the lease could have impacts on archaeological 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.

Potential threats to cultural resources from leasing are variable and dependent upon the nature of the cultural resource and the nature of the proposed development. Effects normally include alterations to the physical integrity of a cultural resource. The greatest potential impact to cultural resources stems from the construction of associated lease related facilities such as pipelines, power lines, roads, and well locations. If a cultural resource is significant for other than its scientific information, effects may also include the introduction of audible, atmospheric, or visual elements that are out of character for the cultural site and diminish the integrity of those criteria that make the site significant.

A potential effect from the proposed action is the increase in human activity or access to the area with the increased potential of unauthorized removal or other alteration to cultural resources in the area. These impacts could include altering or diminishing the elements of a National Register eligible property and diminish an eligible property's National Register eligibility status. Conversely, cultural resource investigations associated with development potentially adds to our understanding of the prehistory/history of the area under investigation and discovery of sites that would otherwise remain undiscovered due to burial or omission during review inventories.

Potential Mitigation: Specific mitigation measures, including, but not limited to, possible site avoidance or excavation and data recovery would have to be determined when site-specific development proposals are received. Provided that Class III cultural resource inventories are conducted as lease development takes place and avoidance measures associated with the preservation of cultural resources are proposed and stipulated during development, there does not appear to be any adverse impacts to cultural resources from leasing. In the event that sites cannot be avoided, mitigating measures will be developed in consultation with Native American tribes that ascribe affiliation or historical relationships to those sites.

4.3.3.2 Native American Religious Concerns

The proposed actions are not known to physically threaten any TCPs, prevent access to sacred sites, prevent the possession of sacred objects, or interfere or otherwise hinder the performance of traditional ceremonies and rituals pursuant to AIRFA or EO 13007. The Roswell Field Office individually invited six tribes/bands/nations to consult if they have concerns for this parcel. There are currently no known remains that fall within the purview of NAGPRA or ARPA that are threatened by leasing. Use of lease notice NM-11-LN will help ensure that new information is incorporated into lease development.

Additional consultation may be initiated at the APD stage of development if BLM professional staff determines it is necessary.

Potential Mitigation: No site-specific mitigation measures for Native American Religious Concerns have been recommended at this time for the parcels recommended to proceed for sale. All parcels recommended to proceed to sale will have the Special Cultural Resource Lease Notice NMLN- 11 attached to the lease.

In the event that lease development practices are found in the future to have an adverse effect on Native American TCPs, the BLM, in consultation with the affected tribe, would take action to mitigate or negate those effects. Measures include, but are not limited to physical barriers to protect resources, relocation of practices responsible for the adverse effects, or other treatments as appropriate.

To be in conformance with the Native American Graves Protection and Repatriation Act of 1991 (Public Law 101-610), the terms and conditions of the lease should contain the following condition: —In the event that the lease holder discovers or becomes aware of the presence of Native American human remains within the lease, they shall immediately notify the Bureau of Land Management in writing.

4.3.3.3 Paleontological Resources

Surface disturbances associated with oil and gas exploration and development activities have the potential to affect paleontological resources in the areas known to contain or have the potential to contain paleontological resources, primarily the areas identified through the Potential Fossil Yield Classification (PFYC) system. Surface-disturbing activities could potentially alter the characteristics of paleontological resources through damage, fossil destruction, or disturbance of the stratigraphic context in which paleontological resources are located, resulting in the loss of important scientific data. Conversely, surface-disturbing activities could also potentially lead to the discovery of paleontological localities that would otherwise remain undiscovered due to burial or omission during review inventories, providing a better understanding of the nature and distribution of those resources.

Potential Mitigation: Paleontological surveys would be required in areas where the potential for paleontological resources exist to avoid disturbing the paleontological resource. Specific mitigation measures, including, but not limited to, possible site avoidance or excavation would have to be determined when site-specific development proposals are received. However, in most surface-disturbing situations, paleontological resources would be avoided by project redesign or relocation. Should a paleontological locality be unavoidable, properties would be mitigated by data collection and excavation prior to implementation of a project.

4.3.4 Water Resources

4.3.4.1 Water Quality - Surface and Groundwater

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

Potential impacts that would occur due to construction of well pads, access roads, pipelines, and power lines 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.

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.

Potential 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.

4.3.4.2 Watershed - Hydrology

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 power lines has occurred. 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.

Potential Mitigation: The operator would stockpile the topsoil from the surface of well pads which would be used for interim and final reclamation of the well pads. Reserve pits may be capped, contoured and seeded as required, and described in attached COAs. 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 COAs. During the life

of the development, all disturbed areas not needed for active support of production operations should undergo “interim” reclamation in order to minimize the environmental impacts of development on other resources and uses. Earthwork for interim and final reclamation must be completed within 6 months of well completion or well plugging (weather permitting). The operator shall submit a Sundry Notices and Reports on Wells (Notice of Intent), Form 3160-5, prior to conducting interim reclamation.

4.3.5 Soil

While the act of leasing a tract would produce no direct 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 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.

Potential Mitigation: The operator would stockpile the topsoil from the surface of well pads in shallow rows 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 COAs. 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 COAs. During the life of the development, all disturbed areas not needed for active support of production operations should undergo “interim” reclamation in order to minimize the environmental impacts of development on other resources and uses. Earthwork for interim and final reclamation must be completed within 6 months of well completion or well plugging (weather permitting). The operator shall submit a Sundry Notices and Reports on Wells (Notice of Intent), Form 3160-5, prior to conducting interim reclamation.

Road constructions requirements and regular maintenance would alleviate potential impacts to access roads from water erosion damage. For the purpose of protecting slopes or fragile soils surface disturbance would not be allowed on slopes over 30 percent.

4.3.6 Vegetation

There would be no direct effects to vegetative resources from the sale of the lease parcel. Subsequent exploration/development of the proposed leases would have indirect impact to vegetation and would depend on the vegetation type, the vegetative community composition, soil type, hydrology, and the

topography of the parcel. Oil and gas development surface-disturbing activities could affect vegetation by destroying the vegetation, churning soils, loss of substrates for plant growth, impacting biological crusts, disrupting seedbanks, burying individual plants, reduction of germination rates, covering of plants with fugitive dust, and generating sites for undesirable weedy species. In addition, development could reduce available forage or alter livestock distribution leading to overgrazing or other localized excess grazing impacts to palatable plant species. If these impacts occurred after seed germination but prior to seed set, both current and future generations could be affected.

Vegetation would be lost within the construction areas of pads, roads, and rights of ways. Those areas covered in caliche, such as pads and roads, would have no vegetation for the life of the well. Rights-of-ways could re-vegetate in one to two years with proper reclamation and adequate precipitation. Inadequate precipitation over several growing seasons could result in loss of vegetative cover, leading to weed invasion and deterioration of native vegetation.

Impacts to vegetation depend on development. These acres would produce no vegetation, due to caliche covered surfaces with each well in production. These acres should be in adequate vegetative cover in three to five growing seasons, if adequate precipitation is received after following interim or final reclamation.

Potential Mitigation: Mitigation would be addressed at the site-specific APD stage of exploration and development. Needed COAs would be identified and addressed during planning at the APD stage. Mitigation could potentially include revegetation with native plant species, soil enhancement practices, direct live haul of soil material for seed bank revegetation, reduction of livestock grazing, fencing of reclaimed areas, and the use of seeding strategies consisting of native grasses, forbs, and shrubs.

4.3.7 Invasive Non-native Species, and Noxious Weeds

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.

Based on an estimate of between two (2) and 16 wells could potentially be drilled on a 640 acre lease, and surface disturbance estimated at 9 acres per well, a range of 18 to 144 acres could potentially be directly affected by invasive or non- native species. Due to wind drift or rain flows, additional areas may be impacted by the spread or encroachment of noxious weeds.

Impacts by noxious weeds would 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.

Potential Mitigation: In the event noxious weeds are discovered during construction of any access roads and well pads, mitigation would be deferred to the site specific development at the APD stage. Best management practices would be incorporated into the Conditions of Approval of an approved APD.

4.3.8 Special Status Species

4.3.8.1 Threatened or Endangered Species

There are no threatened or endangered species that occur within the listed parcel.

4.3.8.2 Special Status Species

Special Status Species are not expected to occur within the listed parcel.

4.3.9 Wildlife

The types and extent of impacts expected from oil and gas development to wildlife species and habitats vary depending on the activity. 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. Although reclamation and restoration efforts for surface disturbance could provide for the integrity of other resources, these efforts may not always provide the same habitat values (e.g. structure, composition, cover, etc.) in the short or in some instance, the long-term in complex vegetative community types. The short-term negative impact to wildlife would occur during the construction phase of the operation due to noise and habitat destruction. In general, most wildlife species would become habituated to the new facilities. For other wildlife species with a low tolerance to these activities, the operations on the well pad would continue to displace them from the area due to ongoing disturbances such as vehicle traffic, noise and equipment maintenance. The conditions of approval would alleviate most losses of wildlife species, such as; fencing the reserve pits, netting storage tanks, installation or other modifications of cones on separator stacks, and timing stipulations. The magnitude of above effects would be dependent on the rate and location of the oil and gas development, but populations could likely not recover to pre-disturbance levels until the activity was completed and the vegetative community restored.

Potential Mitigation: Impacts would be analyzed on a site specific basis prior to development. Stipulations and COAs would be applied at the APD level to minimize wildlife impacts.

4.3.10 Livestock Grazing

Oil and gas development could result in a loss of vegetation for livestock grazing (e.g., direct removal, introduction of unpalatable plant species, etc.), decrease the palatability of vegetation due to fugitive dust, disrupt livestock management practices, involve vehicle collisions, and decrease grazing capacity. These impacts could vary from short-term impacts to long-term impacts depending on the type of exploration or development, the success of reclamation, and the type of vegetation removed for the oil and gas activities.

Potential Mitigation: Measures would be taken to prevent, minimize, or mitigate impacts to livestock grazing from exploration and development activities. Prior to authorization, activities would be evaluated on a case-by-case basis, and the project would be subject to mitigation measures. Mitigation could potentially include controlling livestock movement by maintaining fence line integrity, fencing of facilities, revegetation of disturbed sites, installation of cattle guards, and fugitive dust control.

4.3.11 Visual Resources

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

Mitigation: The flat color Grey-green from the Supplemental Color Chart would be used on all facilities to closely approximate the vegetation within the setting. Other colors from the chart may be required as appropriate to the setting. All facilities, including the meter building, would be painted these colors. If the proposed area is in a scenic corridor, a low profile tank less than eight feet in high is required for the proposed action.

4.3.12 Recreation

While the act of leasing Federal minerals produces no direct 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 effect 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.

Potential Mitigation: None

4.3.13 Socioeconomics and Environmental Justice

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.

Potential Mitigation: None

4.14. Cumulative Impacts

The NMSO manages approximately 41 million acres of Federal mineral estate. Of the 41 million acres, 35 million acres are available for oil and gas leasing. Approximately 17% of the 35 million acres is currently leased (73% of the leases are in production and 63% of the lease acres are in production). The NMSO received 100 parcel nominations (56,854.86 acres) for consideration in the April 2013 Oil & Gas Lease Sale, and is proposing to lease 55 (35,707.88 acres) of the 100 parcels. If these 100 parcels were leased, the percentage of Federal minerals leased would not change. The Carlsbad, Farmington and Oklahoma Field Office (Kansas, Oklahoma and Texas) parcels are analyzed under separate EAs.

Table 5A. Actual - Acres of Federal Minerals/Acres Available/Acres Leased:

State	Federal O&G Mineral Ownership	Acres Available	Acres Leased	Percent Leased
KS	744,000	614,586	127,414	21%
NM	34,774,457	29,751,242	5,023,215	17%

OK	1,998,932	1,668,132	330,800	20%
TX	3,404,298	3,013,207	391,091	13%
Totals/Average	40,921,687	35,058,167	5,862,520	17%

Table 5B. Parcels Nominated & Offered in the January 2013 Oil & Gas Lease Sale:

Field Office	No. of Nominated Parcels	Acres of Nominated Parcels	No. of Parcels to be Offered	Acres of Parcels to be Offered
Carlsbad	11	6,683.29	6	4,121.20
Roswell	1	120.00	1	120.00
Farmington	53	23,913.74	14	5413.60
Kansas	1	240.00	1	240.00
Texas	29	25,118.75	29	25,118.75
Oklahoma	5	779.08	4	694.33
Totals	100	56,854.86	55	35,707.88

Table 5C. Foreseeable - Acres of Federal Minerals/Acres Available/Acres Leased:

State	Federal O&G Mineral Ownership	Acres Available	Acres Leased	Percent Leased
KS	744,000	614,586	127,654	21%
NM	34,774,457	29,751,242	5,053,932	17%
OK	1,998,932	1,668,132	331,579	20%
TX	3,404,298	3,013,207	416,210	14%
Totals/Average	40,921,687	35,058,167	5,929,375	17%

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 parcel offered are adjacent to a developed well field area.

Surface disturbance acreage estimates in the following table, are based on associated oil and gas exploration and development drilling activities as follows:

- Access Roads: 3.0 acres disturbance per access road (14 foot travel way width).
- 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 foot right of way width)
- Power lines: 1.0 acre initial disturbance per producing well
- Total Surface disturbance: 9 acres/well.

Table of Cumulative Impact - Surface Disturbance Estimate based on full field development.			
Parcel	Comments	Parcel Acreage	Spacing

NM-201304-002 T. 0150S, R. 0280E, NM PM, Sec. 025, SENW, E2SW; Chaves County Roswell Field Office	<u>Lease with Stipulations:</u> NM-11-LN Special Cultural Resources SENM-S-39 Plan of Development	120.00	40-acre Spacing	160-acre Spacing	320-acre Spacing
Number of wells			3	0	0
Surface Disturbance, estimate in acres			27	0	0

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.

4.15.1 Air Quality

The small increase in emissions that could result from approval of the proposed action would not result in the Roswell area exceeding the NAAQS for any criteria pollutant. In October 2012, EPA regulations that require control of VOC emissions from oil and gas development became effective. These regulations will reduce VOC emissions from oil and gas exploration and production that contribute to ozone concentrations. Emission from any development of the leases is not expected to impact the 8-hour average ozone concentrations, or any other criteria pollutants in the Roswell area.

4.15.2 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 2010, total U.S. GHG emissions were almost 7 billion (6,821,8 million) metric tons and that total U.S. GHG emissions have increased by 10.5% from 1990 to 2010 (EPA, 2012b). Emissions increased from 2009 to 2010 by 3.2% (213.5 million metric tons CO₂°). The primary causes of this increase were an increase in economic output which increased energy consumption and warmer summer conditions which resulted in an increase in electricity demand for air conditioning (EPA, 2012b).

On-going scientific research has identified the potential effects of anthropogenic GHG emissions such as carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) 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 Roswell Field Office was presented in the 1997 Resource Management Plan (RMP) and associated amendments. 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.

The incremental contribution to global GHG gases from the proposed action cannot be translated into effects on climate change globally or in the area of this 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 (IPCC, 2007; CCSP, 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 (Karl et al, 2009). For example, if global climate change results in a warmer and drier climate, increased particulate matter impacts could occur due to increased windblown dust from drier and less stable soils. Cool season plant species' spatial ranges are predicted to move north and to higher elevations, and extinction of endemic threatened/endangered plants may be accelerated. Due to loss of habitat or competition from other species whose ranges may shift northward, the population of some animal species may be reduced or increased. Less snow at lower elevations would likely impact the timing and quantity of snowmelt, which, in turn, could impact water resources and species dependent on historic water conditions (Karl et al, 2009).

The Inventory of New Mexico Greenhouse Gas Emissions: 2000-2007 estimates that approximately 13.9 million metric tons of GHGs from the natural gas industry and 1.9 million metric tons of GHGs from the oil industry were emitted in 2007 as a result of oil and natural gas production, processing, transmission and distribution. Overall, greenhouse gas emissions in New Mexico decreased slightly from 2000 to 2007 (NMED, 2010). As of 2008, there were 23,196 oil wells and 27,778 gas wells in New Mexico (NMOCD, 2010b).¹

When compared to the total GHG emission estimates from the total number of oil and gas wells in New Mexico, 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.

¹ 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.

The impact of climate change on BLM resources depends upon the location of the affected resource, its vulnerability and resiliency to change, and its relationship to the human environment. There will be positive and negative impacts of climate change, even within a single region. For example, warmer temperatures may bring longer growing seasons in some regions, benefiting farmers who can adapt to new conditions, but potentially harming native plant and animal species. In general, the larger and faster the changes in climate are, the more difficult it will be for human and natural systems to adapt.

Based on current assumptions for climate change, the RFO could see effects to water quantity, quality, and seasonal availability; agriculture and grazing; disease and pest outbreaks; shifting of seasons; shifts in plant and animal population, range, species diversity, and migration patterns; forest quality; and frequency, duration, and location of extreme weather events. Within the RFO itself, there may be local variations.

Climate change also is likely to exacerbate the effects of natural and altered disturbance regimes, including wildfire, insect outbreaks, flooding, and erosion, across all New Mexico's habitat types and may prompt abrupt ecological changes. This is particularly true in ecosystems such as grasslands, riparian areas, and forests where the effects of past management and land use change are substantial (McCarty, 2008).

Most of the RFO is desert and semi-desert shrub and grassland, and these regions may be best adapted for higher temperatures and less rainfall (Price et al. 2005). However, they are still subject to potentially serious climate change impacts, made worse by the large amount of human development and disturbance that has already occurred. Grasslands are affected by two known climate change effects, changes in the timing of precipitation (from summer- to winter-dominated rainfall) and increased CO₂ concentrations (Brown et al. 1997, Morgan et al. 2007). Not only do these factors favor the encroachment of woody shrubs and loss of perennial grass cover, but they may act synergistically with human-linked land use changes in grasslands and elsewhere (Hansen et al. 2002, Peters et al. 2004, Burkett et al. 2005, Jetz et al. 2007, Enquist & Gori, in press). In addition, increasingly high temperatures produce greater evaporative demands on soils, plants, streams, rivers, and reservoirs in every season (McCarty, 2008).

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 life spans in the atmosphere.

Greenhouse gas emissions from oil and gas production increased nationally from 1990-2010. The EPA reports that emissions from Natural Gas Systems in 2010 have decreased from 1990 levels by 14 percent for non-combustion CO₂. This decrease is attributed to improved management practices, technology, and replacement of older equipment. Methane (CH₄) emissions increased 14 percent from 1990-2010 due to an increase in production and production wells (EPA, 2012b). New Mexico oil and gas greenhouse gas emissions would trend similarly to national emissions. Co-benefit reductions of methane from EPA's 2012 oil and gas air quality regulations are expected to significantly reduce methane emissions from gas production.

CHAPTER FIVE

5.0 Consultation/Coordination

This section includes individuals or organizations from the public, external agencies, the interdisciplinary team, and permittees contacted during the development of this document

5.1 Agencies, Persons and Organizations Consulted

Agencies

Clay Nichols, U.S. Fish and Wildlife Biologist.

George Farmer, New Mexico State Game & Fish, SE Area Habitat Specialist.

Tribes Consulted

Apache Tribe of Oklahoma

Comanche Nation

Kiowa Tribe

Mescalero Apache Tribe

Ysleta del Sur Pueblo

5.2 Public Involvement

The parcel nominated for this sale, along with the appropriate stipulations from the RMP, was posted online for a two week review period beginning 29 October 2012. No comments were received. This EA was made available for public review and comment for 30 days beginning 3 December, 2012. No comments were received.

5.3 Preparers

BLM Lease Staff

Glen Garnand, Environmental & Planning Coordinator

Ernest Jaquez, Natural Resources Specialist. Conducted onsite visit.

Al Collar, Geologist

Helen Miller, Rangeland Management Specialist

Jeremy Illif, Archaeologist

Michael McGee, Hydrologist

Michael Bilbo, Outdoor Recreation Planner & Cave Specialist

Christopher J. Brown, Outdoor Recreation Planner

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David Glass, Petroleum Engineer

Vanessa Bussell, Realty Specialist

Beth Skaggs, Natural Resources Specialist

On 20 November 2012, a briefing was held at the New Mexico State Office, to involved State Office staff. Cody Layton of Carlsbad Field Office (CFO) presented RFO parcel along with CFO parcels. Present were State Director Jesse Juen, Deputy State Director Minerals Tony Herrel, Associate Deputy State Director Minerals Mike Tupper, Deputy State Director Resources Bill Merhege, Natural Resources Specialist Rebecca Hunt, Land Law Examiners Margie Duprie and Lisa Rivera, Lead Land Law Examiner Gloria Baca, and Planning & Environmental Coordinators Melanie Barnes and Dave Goodman.

CHAPTER SIX

6.0 References

CCSP, 2008: *Climate Models: An Assessment of Strengths and Limitations*. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research [Bader D.C., C. Covey, W.J. Gutowski Jr., I.M. Held, K.E. Kunkel, R.L. Miller, R.T. Tokmakian and M.H. Zhang (Authors)]. Department of Energy, Office of Biological and Environmental Research, Washington, D.C., USA, 124 pp.

Environmental Protection Agency. 2011. Technology Transfer Network: Clearinghouse for Inventories and Emissions Factors. <http://www.epa.gov/ttn/chief/eiinformation.html>.

Environmental Protection Agency. 2011a. 2005 National-Scale Air Toxics Assessment. Summary of Results. <http://www.epa.gov/ttn/atw/nata2005>.

Environmental Protection Agency, 2012. Air Trends: Design Values. <http://www.epa.gov/airtrends/values.html>. (Accessed 1/4/2013).

Environmental Protection Agency, 2012a. AirData: AQI Report. http://www.epa.gov/airdata/ad_rep_aqi.html. (Accessed 1/4/2013).

Environmental Protection Agency, 2012b. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010. EPA 430-R-12-001. <http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html>. (Accessed 1/7/2013).

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

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

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

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

Intergovernmental Panel on Climate Change (IPCC). Climate Change 2007, Synthesis Report. A Report of the Intergovernmental Panel on Climate Change. Karl, Thomas L., Jerry M. Melillo, and Thomas C. Peterson, (eds.). 2009. Global Climate Change Impacts in the United States, Cambridge University Press.

Karl, Thomas L., Jerry M. Melillo, and Thomas C. Peterson, (eds.). 2009. Global Climate Change Impacts in the United States, Cambridge University Press.

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

New Mexico Department of Agriculture. 2009, Memorandum, New Mexico Noxious Weed List Update. Available on the Internet: <http://www.nmda.nmsu.edu/animal-and-plant-protection/noxious-weeds/State%20Noxious%20Weed%20List%20Update.html>.

New Mexico Environmental Department (NMED). 2006. Appendix D New Mexico Greenhouse Gas Inventory and Reference Case Projections, 1990-2020. Center for Climate Strategies

New Mexico Oil Conservation Division. 2010b. Statistics, Production Summary Report. Available at <http://www.emnrd.state.nm.us/ocd/statistics/Production/ProductionSummaryReport.aspx>

U.S. Department of Agriculture. U.S. Forest Service. 2008. The Southwest Region and Climate Change. U.S. Department of the Interior, Bureau of Land Management. 1994. Draft Environmental Impact Statement. Roswell, New Mexico.

U.S. Department of the Interior, Bureau of Land Management. 2007. Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development: The Gold Book (4th ed), P-417.

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.

USDI. BLM. 2011. Air Quality Technical Report. New Mexico State Office. http://www.blm.gov/nm/st/en/prog/more/air_resources/air_resources_technical.html.

CHAPTER SEVEN

7.0 Authorities

Code of Federal Regulations 43 (CFR) 3100

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

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

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

Appendix 1

NM-201304-002 120.000 Acres
T.0150S, R.0280E, NM PM, NM, Sec. 025 SENW, E2SW;
Chaves County
Roswell FO
NMNM 105210
Formerly Lease No.
Cultural Stipulation: NM-11-LN
Plan of Development Stipulation: SENM-S-39
Visual Resource management: SENM-S-25