

Bureau of Land Management, Roswell Field Office
Environmental Assessment Checklist, EA# NM-510-2008-0076
Mack Energy - Packers Federal #1H

Resources	Not Present on Site	No Impacts	May Be Impacts	Mitigation Included	BLM Reviewer	Date
Air Quality			X		SWA Spec/Hydro. /s/ Mike McGee	4/23/08
Soil			X	X		
Watershed Hydrology			X	X		
Floodplains	X					
Water Quality - Surface			X	X		
Water Quality - Ground			X	X		
Cultural Resources	X				Archaeologist /s/ Rebecca L. Hill	19Jun08
Native American Religious Concerns	X					
Paleontology	X					
Areas of Critical Environmental Concern	X				Plan & Env. Coord. /s/ J H Parman	4/15/08
Farmlands, Prime or Unique	X				Realty /s/ sanderford	6/23/08
Rights-of-Way			X			
Invasive, Non-native Species			X	X	Range Mgmt. Spec. /s/ Joseph M. Navarro	4/11/08
Vegetation			X	X		
Livestock Grazing			X	X		
Threatened or Endangered Species	X				Biologist /s/ D Baggao	4/23/08
Special Status Species	X					
Wildlife			X	X		
Wetlands/Riparian Zones	X				Outdoor Rec. Plnr. /s/ Bill Murry	4/23/08
Wild and Scenic Rivers	X					
Wilderness	X					
Recreation		X				
Visual Resources			X			
Cave/Karst			X			
Environmental Justice		X			Environ .Prot. Specialist. Richard G. Hill	4/8/08
Public Health and Safety		X				
Wastes, Hazardous or Solid		X				
Solid Mineral Resources		X			Geo/SPS /s/ Jerry Dutchover	4/23/08
Fluid Mineral Resources		X			Pet Engr/Geo /s/ John S. Simitz	4/17/08

**DEPARTMENT OF THE INTERIOR,
BUREAU OF LAND MANAGEMENT**

Pecos District Office
2909 W. Second Street
Roswell, New Mexico 88201

Project: Packers Federal #1H
Location: Section: 29, T. 15 S., R. 29 E.
Applicant: Mack Energy Corporation
Roswell Field Office
Chaves County New Mexico

EA Log Number: NM-510-08-76
Lease Number: NM-101106
Right-of-Way Number: NM-120286
File Code: 3160 and 2800

Finding of No Significant Impact

Based upon the analysis of potential environmental impacts contained in the attached environmental assessment, I have determined the proposed action is not expected to have significant impacts on the environment and the preparation environmental impact statement is not warranted.

Decision Record

Based upon the analysis, Mack Energy Corporation will be granted a right-of-way to construct operate, maintain, and terminate an access road to the Packer Federal #1H oil well and their Application for Permit to Drill the oil well is approved. The right-of-way will grant 3,580 feet in length by 30 feet wide with a driving surface of 14 feet. The right-of-way will be issued for a 30-year period with the option to renew.

Packers Federal #1H

Surface Hole: 1675 FNL & 330 FEL, Section 29, T. 15 S., R. 29 E.,
Bottom Hole: 1675 FNL & 2310 FEL Section 29, T. 15 S., R. 29 E.

BLM Right-of-Way NM-120286

W $\frac{1}{2}$ SW $\frac{1}{4}$, and S $\frac{1}{2}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$,
Sec. 28, T. 15 S. R. 29 E.,
Chaves County, New Mexico, NMPM

Rational: The Bureau of Land Management staff has reviewed the environmental assessment and identified site-specific mitigation measures to avoid or minimize surface impacts resulting from the construction of this project. The well pad and access road will remain as long term impacts. The cumulative impacts to the environment from existing and new development have been identified.

This proposed action is in compliance with the 1997 Roswell Resource Management Plan, as amended (RMPA). This plan has been reviewed to determine if the proposed action conforms to the land-use planning terms and conditions required by 43 CFR 1610.5. This action does not conflict with existing Chaves County land-use planning or zoning.

Administrative Review and Appeal: Under BLM regulations, this Decision Record (DR) is subject to administrative review in accordance with 43 CFR 3165. Any request for administrative review of this DR must include information required under 43 CFR 3165.3(b) (State Director Review), including all supporting documentation.

Such a request must be filed in writing with the State Director, Bureau of Land Management, 1474 Rodeo Road, Santa Fe, NM 87505, no later than 20 business days after this DR is received or considered to have been received.

Any party who is adversely affected by the State Director's decision may appeal that decision to the Interior Board of Land Appeals, as provided in 43 CFR 3165.4.

Prepared by:

Date _____
Brian A. Novosak
Natural Resource Specialist

Approved by:

Date _____
Angel Mayes
Assistant Field Manager
Lands and Minerals

**BUREAU OF LAND MANAGEMENT
ROSWELL FIELD OFFICE**

**ENVIRONMENTAL ASSESSMENT # NM-510-08-76
OIL AND GAS LEASE NUMBER NMNM-101106 AND
RIGHT-OF-WAY NMNM-120286
MACK ENERGY CORPORATION
PACKERS FEDERAL #1H**

1.0 Introduction

Mack Energy Corporation has filed an Application for Permit to Drill (APD) horizontally the Packers Federal #1H oil well. There will be a need for approximately 3580 feet in length by 30 feet wide of new access road to the proposed well location. The location for the proposed well is:

Surface Hole: 1675 FNL & 330 FEL, Section 29, T. 15 S., R. 29 E.,
Bottom Hole: 1675 FNL & 2310 FEL Section 29, T. 15 S., R. 29 E.

This site-specific analysis tiers into and incorporates by reference the information and analysis contained in the Roswell Resource Area Resource Management Plan (RMP). This document is available for review at the Roswell Office. This project EA addresses site-specific resources and/or impacts that are not specifically covered within the RMP, as required by the National Environmental Policy Act of 1969 (NEPA), as amended (Public Law 91-90, 42 U.S.C. 4321 et seq.).

1.1 Purpose and Need

The purpose for the proposed action is for further development of a federal oil and gas lease. It is the policy of the BLM to make mineral resources available for disposal and to encourage development of mineral resources to meet National, regional, and local needs. The Mineral Leasing Act of 1920 (MLA), as amended [30 USC 181 et seq.], authorizes the BLM to issue oil and gas leases for the exploration of oil and gas, and permit the development of those leases. An approved APD issued by the BLM, would authorize the applicant to construct and drill a well.

Mack Energy Corporation has applied under Title V of the Federal Land Policy and Management Act of October 21, 1976, to construct, operate, maintain and terminate an access road to the proposed Packers Federal #1 well located in Section 29, T. 15 S., R. 29 E., Chaves County. The proposed access road will be a total length of 3,580 feet (2,470-feet of improvement of to the existing road and 1,110-feet of new road construction) by 30 feet wide with a driving surface of 14-feet for approximately 2.47 acres more or less. The right-of-way will be issued for a 30 year term with the option to renew. The following is the location of the proposed right-of-way:

BLM Right-of-Way NM-120286
W $\frac{1}{2}$ SW $\frac{1}{4}$, and S $\frac{1}{2}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$.
Sec. 28, T. 15 S. R. 29 E.,
Chaves County, New Mexico, NMPM

1.2 Conformance with Applicable Land Use Plan and Other Environmental Assessments

Pursuant to 40 Code of Federal Regulations (CFR) 1508.28 and 1502.21, this site-specific EA tiers to and incorporates by reference the information and analysis contained in the 1997 Roswell RMP, as amended. The RMP is available for review at the Roswell Field Office, Roswell, New Mexico. This EA addresses the resources and impacts on a site-specific basis as required by the National Environmental Policy Act (NEPA) of 1969, as amended (Public Law 91-90, 42 USC 4321 et seq.) and conforms to the Roswell Resource Management Plan October 1997 as amended, Mineral Leasing Act of 1920 (MLA), as amended [30 USC 181 et seq.], and Title V of the Federal Land Policy and Management Act of October 21, 1976 (90 Stat. 2776; 43 U.S.C. 1761).

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

Under Section 402 of the Clean Water Act (as amended), the U.S. Environmental Protection Agency (EPA), was directed to develop a phased approach to regulate storm water discharges under the National Pollutant Discharge Elimination System (NPDES) program. Industrial activities disturbing land may require permit coverage through a NPDES storm water discharge. Depending on the acreage disturbed, either a Phase I industrial activity (5 or more acres disturbance) or a Phase II small construction activities (between 1 and 5 acres disturbance) permit may be required. Additionally, an U.S. Army Corps of Engineers Section 404 permit for the discharge of dredge and fill materials may also be required. Additionally, a New Mexico Surface Water Quality Bureau 401 certification may also be required under a U.S. Army Corps of Engineers Section 404 permit. Operators are required to obtain all necessary permits and approvals prior to any disturbance activities.

Roswell Field Office staff reviewed the proposed action and determined it would be in compliance with threatened and endangered species management guidelines outlined in Biological Assessments Cons. #2-22-96-F-102, Cons. #22420-2006-I-0144, and Cons. #22420-2007-TA-0033. No further consultation with the U.S. Fish and Wildlife Service is required. .

Compliance with Section 106 responsibilities of the National Historic Preservation Act are adhered to by following the BLM – New Mexico State Historic Preservation Officer protocol agreement, which is authorized by the National Programmatic Agreement between the *BLM*, the *Advisory Council on Historic Preservation*, and the *National Conference of State Historic Preservation Officers*, and other applicable BLM handbooks.

Additionally, the Operator is required to:

- Comply with all applicable Federal, State and local laws and regulations.
- Obtain the necessary permits for the drilling, completion and production of these wells including water rights appropriations, the installation of water management facilities, water discharge permits, and relevant air quality permits.

- Certify that a Surface Use Agreement has been reached with private landowners where required.

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

2.0 Alternatives Including the Proposed Action

2.1 Alternative A – No Action

The BLM NEPA Handbook (H-1790-1) and the National Environmental Policy Act and associated Code of Federal Regulations state that for EAs on externally initiated proposed actions, the No Action Alternative means that the proposed activity would not take place. The No Action Alternative is presented for baseline analysis of resource impacts, and if selected, would deny the approval of the proposed application. Current land and resource uses would continue to occur in the proposed project area. No mitigation measures would be required.

2.2 Alternative B – Proposed Action

Mack Energy Corporation submitted their first Notice of Staking on February 21, 2008, to drill the Packer #1H oil well. The Application for Permit to Drill was submitted on April 4, 2008 and considered complete on May 8, 2008. Mack Energy Corporation proposes to construct a well pad located within a 600' x 600' area. The well pad would be 300 feet long by 300 feet wide (plus 30' X 30'). No reserve pits will be used; the operator opted to use the **Closed Loop System**. The drill hole cuttings will be trucked off the well pad to an authorized disposal site. Standard oilfield construction equipment consisting of; track-type tractors, motor graders, dump trucks and water trucks would be used to construct the access road and well pad.

1. **ACCESS ROAD:** The entire access road system is 21,510 feet (4.07 miles) in length from locatable County Road 217 to the well pad. The access road will utilize existing right-of-way NM-119538 for 17,480 feet (3.31 miles). Mack Energy Corporation is the right-of-way holder for NM-119538. Continuing from NM-119538, the off-lease access road upon federal surface has been assigned BLM right-of-way number NM-120286. The first 2,470 (0.47 miles) of NM-120286 will be improvement to an existing 2-track road. The last 1110 feet (0.21 miles) of NM-120286 will be new road construction. The remaining 450 feet (0.09 miles) of access road is on lease new-road construction and does not require a right-of-way. The road will have a driving surface (travelway) of 14 feet in width with a maximum 30-foot wide surface disturbance area for the road construction. All other existing access roads would be maintained in a good or better condition than those existing at commencement of operations.
2. **WELL PAD:** Mack Energy Corporation proposes to construct a well pad located within a 600' x 600' area. The well pad would be 300 feet long by 300 feet wide (plus 30' X 30'). No reserve pits will be used; the operator opted to use the **Closed Loop System**. The drill hole cuttings will be trucked off the well pad to an authorized disposal site. Standard oilfield construction equipment consisting of; track-type tractors, motor graders, dump trucks and water trucks would be used to construct the access road and well pad.

Proposed Well Information:

Well Name	Number	Township	Range	Section	Lease Number	Date Lease Issued
Packers Federal	1H	15 S.	29 E.	29	NMNM101106	08/20/1998

County: Chaves

Applicant: Mack Energy Corporation
PO Box 960
Artesia, NM 88211

Surface Owners: Bureau of Land Management

2.3 Alternative C – Preferred Alternative

An onsite was conducted February 29, 2008; all areas of proposed surface disturbance were inspected to ensure that potential impacts to natural resources would be minimized. Changes were made as described below to alleviate or minimize environmental impacts. These changes may include the following: rerouting of access roads; and moving, modifying, mitigating, or dropping from further consideration well locations, pipelines, discharge points and other water management control structures. Alternatives to the different aspects of the proposed action are always considered and applied as preapproval changes, site specific mitigation and/or Conditions of Approval, if they will alleviate or minimize environmental impacts of the operator's proposal. The specific changes identified for the well are listed below under 2.3.1:

2.3.1 Changes as a result of the on-sites:

The operator changed the original application to alleviate or minimize environmental impacts related to drainage conflicts. A second onsite was conducted March 2, 2008 after the operator moved the location. The APD incorporating the above changes was submitted April 4, 2008.

2.4 Alternatives Considered But Not Analyzed In Detail

Relocate the Proposed Action:

The well location is determined on the basis of subsurface geologic information. No other alternative location would have significantly fewer impacts than, or have a clear advantage over, the projected location. Therefore, the alternative of changing the location involved in this action is not analyzed further in this EA.

3.0 Description of Affected Environment

This section describes the environment that would be affected by implementation of the alternatives described in Section 2. Aspects of the affected environment described in this section focus on the relevant major resources or issues. Certain critical environmental components require analysis under BLM policy. These items are included below in Table 3.0, found as the

first page of this document. Following the table, only the aspects of the affected environment that are potentially impacted are described. The following elements are not present: Areas of Critical Environmental Concern, Prime or Unique Farmlands, Floodplains, Wild and Scenic Rivers, Wilderness or Wilderness Study Areas, and Wild Horses and Burros.

The proposed well is located in Chaves County, New Mexico and described in the 1997 Roswell RMP Record of Decision. Additional general information on air quality in these areas is contained in Chapter 3 of the Roswell Draft RMP/Environmental Impact Statement.

In addition to the air quality information in the RMPs cited above, new information about GHGs and their effects on national and global climate conditions has emerged since the RMPs were prepared. On-going scientific research has identified the potential impacts of GHG emissions such as carbon dioxide (CO₂) methane (CH₄); nitrous oxide (NO); water vapor; and several trace gasses on global climate. Through complex interactions on a global scale, GHG emissions cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia (along with corresponding variations in climatic conditions), industrialization and burning of fossil carbon sources have caused GHG concentrations to increase measurably, and may contribute to overall climatic changes, typically referred to as global warming.

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

3.1 Air Resources

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

The Environmental Protection Agency (EPA) has the primary responsibility for regulating air quality, including seven nationally regulated ambient air pollutants. Regulation of air quality is also delegated to some states. Air quality is determined by atmospheric pollutants and chemistry, dispersion meteorology and terrain, and also includes applications of noise, smoke management, and visibility. Climate is the composite of generally prevailing weather conditions of a particular region throughout the year, averaged over a series of years. Greenhouse gases (GHGs) and the potential effects of GHG emissions on climate are not regulated by the EPA, however climate has the potential to influence renewable and non-renewable resource management.

3.1.1 Air Quality

The proposed action falls within a Class II Air quality. A Class II area allows moderate amounts air quality degradation. The primary sources of air pollution are dust from blowing wind on disturbed or exposed soil and exhaust emissions from motorized equipment.

The Environmental Protection Agency's (EPA) U.S. Greenhouse Gas inventory lists six types of gases which contribute to global average radiative forcing on global warming potential. These gases include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). The levels of these greenhouse gases (GHG) have been increasing and are expected to continue increasing. These emissions are present because of the oil and gas development within the Roswell Field Office.

3.2 Cultural Resources

The project falls within the Southeastern New Mexico Archaeological Region. This region contains the following cultural/temporal periods: Paleoindian (ca. 12,000-8,000 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 to 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.

3.3 Native American Religious Concerns

A review of existing information indicates the proposed action is outside any known Traditional Cultural Property.

3.4 Environmental Justice

Executive Order 12898 requires Federal agencies to assess projects to ensure there is no disproportionately high or adverse environmental, health, or safety impacts on minority and low-income populations.

3.5 Invasive & Noxious Weeds

There are no known populations of invasive or noxious weed species on the proposed access road and well pad.

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.

Further, 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.

3.6 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.

The Roswell Field Office; Wildlife Biologist reviewed and determined the proposed action is in compliance with listed species management guidelines outlined in the 1997 Biological Assessment (Cons. #2-22-96-F-102). No further consultation with the Service is required.

There are no known threatened or endangered species of plant or animals within the project area. The list of federal threatened, endangered and candidate species reviewed for this EA can be found in Appendix 11 of the Roswell Approved RMP (AP11-2).

3.7 Wildlife

The vegetation found at this site provides habitat to a large range of wildlife species. Some of the common mammals are mule deer, pronghorn, badger, coyote, fox, jackrabbit, cottontails, kangaroo rats, and pocket gophers. It also provides habitat for a variety of grassland and desert birds. Important passerine birds include meadowlarks, horned larks, lark buntings, Cassin's sparrows, lark sparrows, Chihuahuan ravens, and loggerhead shrikes. Other birds include scaled quail, mourning doves, roadrunners, common nighthawks, killdeer, and a variety of raptors including red tailed and Swainson's hawks, northern harriers, great horned owls, and burrowing owls. It also provides habitat to a large variety of common lizards and snakes.

3.8 Special Status Species

There are no known special status species in the project area.

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

3.9 Wastes, Hazardous or Solid

No hazardous or solid waste material will be removed from the project area.

3.10 Water Quality

Surface:

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.

Ephemeral surface water within the area may be located in tributaries, playas, alkali lakes and stock tanks. No perennial surface water is found on public land in the area of operations.

Ground:

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

Most of the groundwater in the area is used for livestock purposes and is found at depths above 200 ft. Essentially, Alluvium and any redbeds present above the Rustler can contain usable water.

3.11 General Topography/Surface Geology

The topographic characteristics and/or regional setting of the project area are: The area has a minor drainage on the northeast side of the well pad that will not be affected by the well pad construction. The topography of the area includes a minor hill where the road will be constructed on and the road route will provide a stable road base. No major land features will be affected.

3.12 Mineral Resources

Construction material (caliche/gravel) for surfacing the access road and well pad could be obtained by the operator from a federal pit in the NE¼ of Section 34, T. 15 S., R. 29 E., Chaves County, New Mexico. Material can also possibly be obtained at no charge from nearby abandoned oil and gas roads and pads.

3.13 Soil

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

Tencee gravelly loam, 1 to 9 percent slopes (Te) Runoff of the unit soil is medium and the hazard of water erosion is moderate and the hazard of soil blowing is slight.

Tencee-Sotim association, 0 to 9 percent slopes (TS) For Tencee soils the hazard of water erosion is moderate and the hazard of soil blowing is slight. For Sotim soils the hazards of water erosion and soil blowing are moderate. Runoff is medium.

3.14 Watershed – Hydrology

The watershed and hydrology in the area is affected by land and water use practices. The degree to which hydrologic processes are affected by land and water use depends on 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 a well pad, permanent and temporary road, pipeline and powerline.

3.15 Vegetation

This lease is within the Mixed Desert Shrub community as identified in the Roswell Resource Management Plan/Environmental Impact Statement (RMP/EIS). Appendix 11 of the Draft RMP/EIS describes the Desired Plant Community (DPC) concept and identifies the components of each community.

The Ecological Site Description for the well pad and access road is Shallow SD-3 (Southern Desertic Basins, Plains & Mountains).

3.16 Livestock Grazing/Range

This proposed action is located on BLM grazing allotment #65075 Turkey Track, Permitted to Bogle Ltd. Company, P.O. Drawer 460, Dexter, NM 88230. Current permitted use is 4,587 AU's year long @ 52% public land for 28,623 AUM's Animal Unit Months. Cattle and horses are the class of livestock authorized.

3.17 Visual Resources

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

3.18 Recreation

The area around the proposed action site is primarily used by recreational visitors engaged in hunting. Caving, sightseeing, driving for pleasure, off-highway vehicle use, and other recreational activities. Non-recreation visitors include oil and gas industrial workers and ranchers.

3.19 Cave/Karst

While the proposed action is located in the *Low Potential Karst Area*), no surface cave/karst features were observed in the immediate vicinity of the proposed action.

3.20 Public Health and Safety

The project will not be detrimental to public health. The operator will insure that all phases of the project operations are conducted in workman like manner. Precautionary procedures and/or measures will be strictly adhered to in order provide a safe and sound working environment for the general existence of the well.

4.0 Environmental Consequences and Proposed Mitigation Measures

Alternative A, No Action Alternative

Under the No Action Alternative, the proposed well would not be drilled. There would be no new impacts from oil and gas production to the resources. The No Action Alternative would result in the continuation of the current land and resource uses in the project area and is used as the baseline for comparison of alternatives.

Alternative B, Proposed Action

The Proposed Action, the well would be drilled as proposed in the April 2, 2008 APD, incorporating changes to reduce the potential impact to the environment. A summary of potential surface disturbance is presented in Table 4.0. Descriptions of potential impacts on individual resources for action alternatives is presented in the following text. Also described are mitigation measures that could be incorporated by the BLM where appropriate as Conditions of Approval attached to the permit.

Table 4.0 Summary of Disturbance

Facility	Number of Miles	Acreage of Disturbance	Duration of Disturbance
Well Pad		2.1	Long Term
Road Right-Of-Way NM-120286	0.7	2.5	Long Term

Short-term impacts are those which can be stabilized or mitigated rapidly (within 5 years). Long-term impacts are those that would substantially remain for more than 5 years.

4.1 Air Quality

The area of the proposed action is considered a Class II air quality area. A Class II area allows moderate amounts air quality degradation. The primary sources of air pollution are dust from blowing wind on disturbed or exposed soil and exhaust emissions from motorized equipment.

4.1 Air Resources

4.1.1 Direct and Indirect Effects

Air Quality

Air quality would temporary be directly impacted with pollution from exhaust emissions, chemical odors, and dust that would be caused by the motorized equipment used to construct the access road, well pad, and by the drilling rig that will be used to drill the well. Dust dissemination would discontinue upon completion of the construction phase of the access road and well pad. Air pollution from the motorized equipment would discontinue at the completion of the drilling phase of the operations. The winds that frequent the southeastern part of New Mexico generally disperse the odors and emissions. The impacts to air quality would be greatly reduced as the construction and drilling phases are completed. Other factors that currently affect air quality in the area include dust from livestock herding activities, dust from recreational use, and dust from use of roads for vehicular traffic.

Over the last 10 years, the leasing of Federal oil and gas mineral estate in Roswell Field Office has resulted in an average total of 60 wells drilled on federal leases annually. These wells would contribute a small percentage of the total emissions (including GHG's) from oil and gas activities in New Mexico.

Potential impacts of development could include increased air borne soil particles blown from new well pads or roads, exhaust emissions from drilling equipment, compressors, vehicles, and dehydration and separation facilities, as well as potential releases of GHG and volatile organic compounds during drilling or production activities. The amount of increased emissions cannot be quantified at this time since it is unknown how many wells might be drilled, the types of equipment needed if a well were to be completed successfully (e.g. compressor, separator, dehydrator), or what technologies may be employed by a given company for drilling any new wells. The degree of impact will also vary according to the characteristics of the geologic formations from which production occurs.

The reasonable and foreseeable development scenario developed for the Roswell RMP demonstrated 60 wells would be drilled annually for Federal minerals. Current APD permitting trends within the field office confirm that these assumptions are still accurate. This level of exploration and production would contribute a small incremental increase in overall hydrocarbon emissions, including GHGs, released into the planet's atmosphere. When compared to total national or global emissions, the amount released as a result of potential production from the proposed lease tracts would not have a measurable effect on climate change due to uncertainty and incomplete and unavailable information.

Consumption of oil and gas developed from the proposed well is expected to produce GHGs. Consumption is driven by a variety of complex interacting factors including energy costs, energy efficiency, availability of other energy sources, economics, demography, and weather or climate.

Climate

The assessment of GHG emissions and climate change is in its formative phase. It is currently not feasible to know with certainty the net impacts from the proposed action on climate. The inconsistency in results of scientific models used to predict climate change at the global scale coupled with the lack of scientific models designed to predict climate change on regional or local scales, limits the ability to quantify potential future impacts of decisions made at this level. When further information on the impacts to climate change is known, such information would be incorporated into the BLM's planning and NEPA documents as appropriate.

4.1.2 Mitigation

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

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

The EPA data show that improved practices and technology and changing economics have reduced emissions from oil and gas exploration and development (Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006). One of the factors in this improvement is the adoption by industry of the Best Management Practices proposed by the EPA's Natural Gas Energy Star program. The Roswell Field Office will work with industry to facilitate the use of the relevant

BMPs for operations proposed on federal mineral leases where such mitigation is consistent with agency policy.

4.2 Cultural Resources

A cultural resource inventory was conducted for the area of effect (08-R-074-A), no Historic Properties were identified. No cultural resources will be affected.

4.3 Native American Religious Concerns

To date, the areas to be affected by project construction has not been identified by interested tribes as being of tribal concern.

4.4 Environmental Justice

4.4.1 Direct and Indirect Impacts

No minority or low income populations would be directly affected in the vicinity of the proposed action. 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 where vehicular traffic increases in areas used for grazing or hunting. However, these impacts would apply to all public land users in the project area.

4.5 Invasive, Non-native Species

4.5.1 Direct and Indirect Impacts

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 if they were previously used and or driven across or through noxious weed infested areas. The potential for the dissemination of invasive and noxious weed seed may be elevated by the use of construction equipment typically contracted out to companies that may be from other geographic areas in the region. Washing and decontaminating the equipment prior to transporting onto and exiting the construction areas would minimize this impact.

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

4.5.2 Mitigation

In the event noxious weeds are discovered after the construction of the access road and well pad, measures will be taken to mitigate those impacts.

4.6 Wastes, Hazardous or Solid

4.6.1 Direct and Indirect Impacts

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

4.6.2 Mitigation - The Conditions of Approval have mitigation measures that would minimize any potential impacts.

4.7 Water Quality:

Surface;

4.7.1A Direct and Indirect Impacts

Surface disturbance from the construction of the well pad, access road, pipelines, and powerlines can result in degradation of surface water quality and groundwater quality from non-point source pollution, increased soil losses, and increased gully erosion.

Potential direct impacts that would occur due to construction of the well pad, access road, pipelines, and powerlines include increased surface water runoff and off-site sedimentation brought about by soil disturbance: increased salt loading and water quality impairment of surface waters; channel morphology changes due to road and pipeline crossings; and possible contamination of surface waters by produced water.

The magnitude of these impacts to water resources would depend on the proximity of the disturbance to the drainage channel, slope aspect and gradient, degree and area of soil disturbance, soil character, duration and time within which construction activity would occur, and the timely implementation and success or failure of mitigation measures.

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

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

4.7.2A Mitigation

The use of a plastic-lined reserve pit 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 soil onsite, or offsite, and may potentially impact surface and groundwater resources in the long term.

B. Groundwater;

4.7.1B Direct and Indirect Impacts

Petroleum products and other chemicals, accidentally leaked through casing, could result in surface and groundwater contamination. Similarly, possible leaks from reserve and evaporation pits could degrade surface and ground water quality State Engineers' water listing shows water for use stock in the Quaternary Alluvium.

The deepest expected usable water occurs above 200 based on the top of the Rustler. The Rustler top varies little over sections 19, 28, 29 30 and 31. It appears that 200 ft is a good surface casing depths or 25ft into the top of the Rustler whichever is the lesser.

4.7.2B Mitigation

The casing and cementing requirements imposed on the proposed well would reduce or eliminate the potential for groundwater contamination from drilling muds and other surface sources.

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 soil onsite, or offsite, and may potentially impact surface and groundwater resources in the long term.

4.8 General Topography/Surface Geology

The surface disturbance anticipated from the construction of the well pad and access road would have minimal impacts on the area of the operations. No major land or soil displacement would occur from the cradle to grave operations associated with construction of the access road and well pad.

4.8.1 Direct and Indirect Impacts

Direct impacts would result from the removal of the surface soils (topsoil) during construction of the well pad and access road. The consequential earth moving activities would indirectly impact the vegetation and would cause the fragmentation of the surface habitat where small animals live in the project area.

4.8.2 Mitigation

The inclusion of mitigation measures to conserve the landscape as much as possible in the Conditions of Approval would lessen the impacts from the surface disturbance activities on this project.

4.9 Soil

4.9.1 Direct and Indirect Impacts

The construction of the access road, well pad, and reserve pit would physically disturb the topsoil and would expose the substratum soil. (See -Table 4.0 for Summary of Disturbance).

Direct impacts resulting from the oil and gas construction of the well pad, access road, and reserve pit 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 site, access road, gas pipelines and production facilities.

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

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

4.9.2 Mitigation

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

Upon abandonment of the well and/or when the access road is no longer in service the Authorized Officer shall issue instructions and/or orders for surface reclamation/restoration of the disturbed areas as described in the attached Conditions of Approval.

Road constructions requirements and regular maintenance would alleviate potential impacts to the access road from water erosion damage.

4.10 Watershed - Hydrology

4.10.1 Direct and Indirect Impacts

Construction and surface disturbance activities from the construction of the well pad, access road, pipelines and powerlines can result in long term and short term alterations to the hydrologic regime. Peak 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 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 the well and would decrease once the surfacing material has been removed from the well pad and access road. Short term direct and indirect impacts to the watershed and hydrology would occur from access roads that are not surfaced with material and would likely decrease in time due to reclamation efforts.

4.10.2 Mitigation

The operator will stockpile the topsoil from the surface of the well pad which will later be used for surface reclamation of the well pad. Upon abandonment of the well and/or when the access road is no longer in service the Authorized Officer will issue instructions and/or orders for surface reclamation/restoration of the disturbed areas as described in the attached Conditions of Approval.

4.11 Vegetation

4.11.1 Direct and Indirect Impacts

The construction of the access road and well pad would remove native vegetation. (See - Table 4.0 for Summary of Disturbance).

If it is a producing well, reclamation would not commence until the well is a depleted producer and is plugged and abandoned. Vegetative recovery on the access road and well pad would depend on life of the well. Native vegetation would encroach on the well pad over time and where high volumes of vehicular traffic occur, the areas driven over would remain unvegetated. If the well is drilled as a dry hole and is plugged, the reclamation of the access road and well pad

would immediately follow. The impacts to the vegetation would be short-term if the reclamation efforts of the disturbed areas have re-vegetated successfully within a few years.

4.11.2 Mitigation

No impact to vegetation is anticipated. However measures will be taken in the event impacts to vegetation are found.

4.12 Livestock Grazing/Range

4.12.1 Direct and Indirect Impacts

During the construction of the access road and pad and during drilling phases of the well, there would be some minor disruption of livestock grazing in the pastures, specifically on the well pad. The increase of vehicle traffic within the project areas could lead to conflicts with livestock.

4.12.2 Mitigation

If any conflicts with livestock do arise as a result of the access road and well pad construction, mitigation measures will be taken, and consultation with the allottee will mitigate those impacts.

4.13 Wildlife

4.13.1 Direct and Indirect Impacts

Some small wildlife species may be killed and their dens or nests destroyed during construction of the access road and well pad.

The construction of the access road and well pad could cause fragmentation of wildlife habitat. The short-term negative impact to wildlife would occur during the construction phase of the operations would be 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 activities, the operations on the well pad would continue to displace wildlife from the area due to disturbances by the high volumes of vehicle traffic during equipment maintenance. Upon abandonment of the well, the area would revegetate and wildlife would return to previous levels.

4.13.2 Mitigation

The conditions of approval would alleviate most losses of wildlife species, such as; netting storage tanks, installation or other modifications of cones on separator stacks, and timing stipulations.

4.14 Recreation

Oil and gas activities would have little or no affect on recreational opportunities within this area. Large blocks of public land would allow recreationist to use public land and avoid the oil and gas facilities within the area.

4.14.1 Direct and Indirect Impacts - None

4.14.2 Mitigation - None

4.15 Visual Resources

Facilities, such as condensate and produced water or oil storage tanks that rise above eight feet, would provide a geometrically strong vertical and horizontal visual contrast in form and line to the characteristic landscape and vegetation, which have flat, horizontal to slightly rolling form and line. The construction of an access road, well pad and other ancillary facilities would slightly modify the existing area visual resources. The proposed action is located in an area designated VRM Class IV.

The objective of Class IV 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.”

Through color manipulation, by painting well facilities to blend with the rolling to flat vegetative and/or landform setting with a gray-green to brownish color, the view is expected to favorably blend with the form, line, color and texture of the existing landscape. The flat color Olive Drab from the supplemental environmental colors also closely approximates the brownish color of the setting. All facilities, including the meter building, would be painted this color.

Cumulative adverse visual impacts can be avoided by gradually moving into a more appropriate vegetative/landform setting color scheme.

4. 15.1 Direct and Indirect Impacts

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

4.15.2 Mitigation

The flat color Olive Drab 18-0622 TPX from the Supplemental Environmental Colors Chart is to be used on all facilities to closely approximates the vegetation within the setting. All facilities, including the meter building, would be painted this color.

4.16 Cave/Karst

While the proposed action is located in the *Low Potential Karst Area*, no surface cave/karst features were observed in the immediate vicinity of the proposed action.

4. 16.1 Direct and Indirect Impacts - None

4. 16.2 Mitigation - None

4.17 Public Health and Safety

4.17.1 Direct and Indirect Impacts

The construction and drilling operations will be conducted in a safe workman like manner and no impacts are anticipated to occur when the operations are conducted in a professional constructive manner.

4.17.2 Mitigation - non-required

4.18 Cumulative Impacts

The leased area of the proposed action has been industrialized with oil and gas well development. The surface disturbance for each project that has been permitted has created a spreading out of land use fragmentation. The cumulative impacts fluctuate with the gradual reclamation of well abandonments and the creation of new additional surface disturbances in the construction of new access roads and well pads. The ongoing process of restoration of abandonments and creating new disturbances for drilling new wells gradually accumulates as the minerals are extracted from the land. Preserving as much land as possible and applying appropriate mitigation measures will alleviate the cumulative impacts.

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.

Greenhouse gas (GHG) emissions from all oil and gas wells within the field office total approximately 4.7 million metric tons annually. The reasonable and foreseeable development (RFD) was based on drilling activity from 1975 through 2005 and was projected 20 years in the future. Therefore, the GHG emissions for oil and gas development for this time period are approximately 235 million metric tons.

This total is most likely an over estimate based on four factors. One factor is that GHG emissions have gradually grown over the past 50 years and the number used in these calculations was an estimate of current emissions. The second factor is the future GHG emissions will decrease as the best management practices are implemented. The third factor is the calculations presented here do not take into account wells that go out of production and are plugged and abandoned.

The fourth factor is the calculations shown here are based on the number of wells drilled per year and not every well drilled is a producer. Non-producers or dry holes would not produce GHG emissions.

Finally, the EPA estimates the total GHG emissions from oil and natural gas production, procession, transmission and distribution account for only 11 percent of the total GHG emissions nationwide.

While it is likely that there will be no significant cumulative impact from the proposed actions, continued oil and gas development, and other surface-disturbing activities in these areas, may potentially have negative cumulative impacts on vegetation, soil, water, livestock, wildlife and visual resources.

5.0 Consultation/Coordination

This section includes individuals or organizations from the public and its' users, the interdisciplinary team, and permittees that were contacted during the development of this document. Onsite inspection(s) was conducted on (3/2/08)

Table 5.1 Summary of Public Contacts Made During Preparation of Document and Interdisciplinary Team

Public Contact	Title	Organization	Present at Onsite?
Mr. Jerry Sherrell Sr.	Company Representative	Mack Energy Corporation	Present
ID Team Member	Title	Organization	Present at Onsite?
Richard G. Hill	Environmental Protection Specialist	RFO	Present
Michael McGee	Hydrologist	RFO	Present
Scott Sanderford	Realty Specialist.	RFO	Present

6.0 Appendices

Pecos District-RFO, Conditions of Approval (**Exhibit A**), Right-of-Way stipulations (**Exhibit B**) The Roswell Field Office; Well and Road Access Location Map (Exhibit C). The special requirements derived from this EA, are to be applied to this proposed action to minimize the surface disturbance and conserve the surrounding landscape.

6.1 References

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

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

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

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

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

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

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

US Government Accountability Office Report "Climate Change, Agencies Should Develop Guidance for Addressing the Effects on Federal Land and Water Resources" GAO-07-863, August 2007 (1st paragraph, 1st page, GAO Highlights) at: <http://www.gao.gov/news.items/d07863.pdf>.

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

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

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

6.1.1 APD – Complete

6.1.2 Authorities

Code of Federal Regulations (CFR 43) 3160 and (CFR 43) 2800

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.

Mineral Leasing Act of 1920, as amended (30 U.S.C. 181 et seq.)

6.1.3 Other Supporting Information

**EXHIBIT A
PECOS DISTRICT - RFO
CONDITIONS OF APPROVAL**

OPERATORS NAME: Mack Energy Corporation
LEASE NO.: NMNM-101106
WELL NAME & NO: Packers Federal #1H
SURFACE HOLE FOOTAGE: 1675' FNL & 330' FEL
BOTTOM HOLE LOCATION: 1675' FNL & 2310' FEL
LOCATION: Section 29, T. 15 S., R. 29 E., NMPM
COUNTY: Chaves County, New Mexico

GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

I. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD (Filing of a Sundry Notice is required for this 60 day extension).

II. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

III. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations (access road and/or well pad). Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

IV. CONSTRUCTION

A. NOTIFICATION:

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Roswell Field Office at (505) 627-0247 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved Application for Permit to Drill and Conditions of Approval on the well site and they shall be made available upon request by the Authorized Officer.

B. TOPSOIL:

The operator shall utilize topsoil for berms around the north, east, and west side boundary of the well pad. The topsoil to be stripped is approximately 6 inches in depth. The topsoil shall not be used to backfill the reserve pit and will be used for interim and final reclamation.

C. CLOSED LOOP SYSTEM: No reserve pit will be used.

The operator shall use a **Closed Loop System** instead of a reserve pit. The drill hole cuttings shall be properly disposed of at an authorized disposal site.

D. FEDERAL MINERAL MATERIALS PIT:

If the operator elects to surface the access road and/or well pad, mineral materials extracted from a federal pit may be used for surfacing the well pad and access road and other facilities on the lease.

Payment shall be made to the BLM prior to removal of any federal mineral materials from any federal pit. Call the Roswell Field Office at (505) 627-0236.

E. WELL PAD SURFACING:

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation.

The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational need.

F. ON LEASE ACCESS ROADS:

Road Egress and Ingress

The access road shall be constructed to access the southeast corner of the well pad.

Road Width

The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed thirty (30) feet.

Surfacing

Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

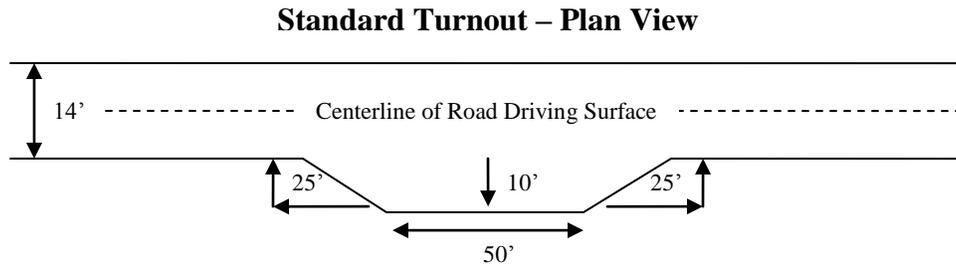
The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

Crowning

Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

Turnouts

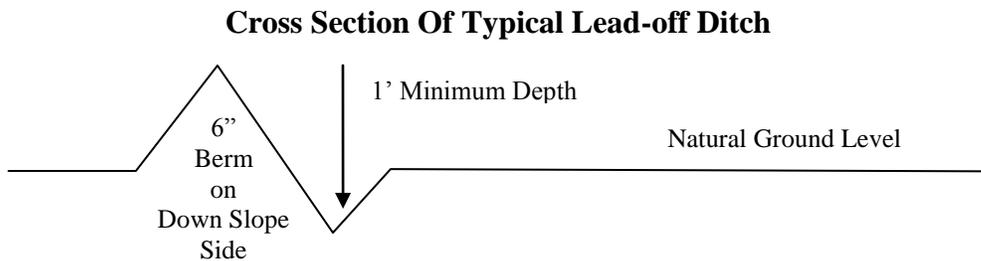
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall be constructed on all blind curves. Turnouts shall conform to the following diagram:



Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill out-sloping and in-sloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula For Spacing Interval Of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$400 \text{ foot road with } 4\% \text{ road slope: } \frac{400'}{4\%} + 100' = 200' \text{ lead-off ditch interval}$$

Fence Requirement

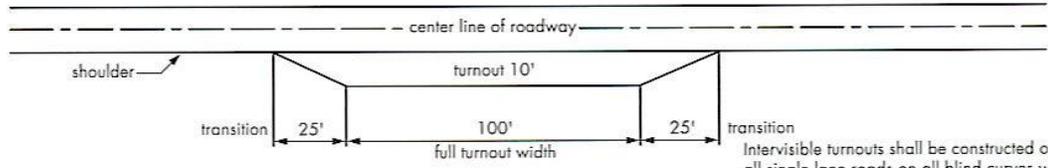
Where entry is required across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting.

The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fence(s).

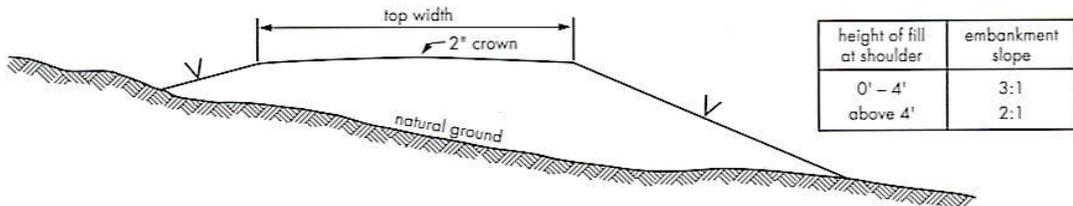
Public Access

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

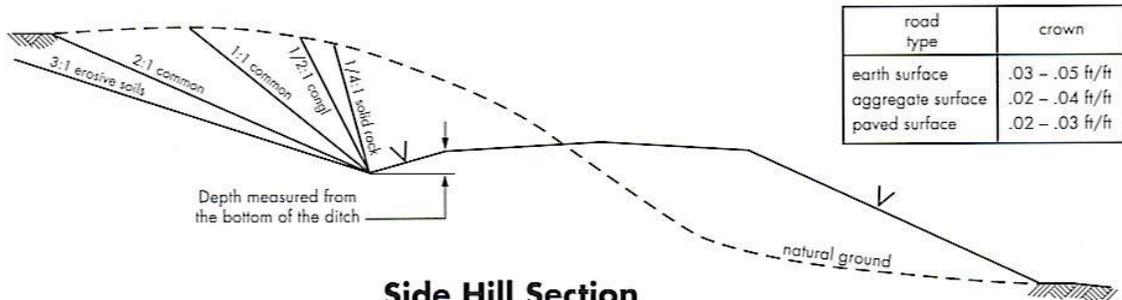
Figure 1 – Cross Sections and Plans For Typical Road Sections



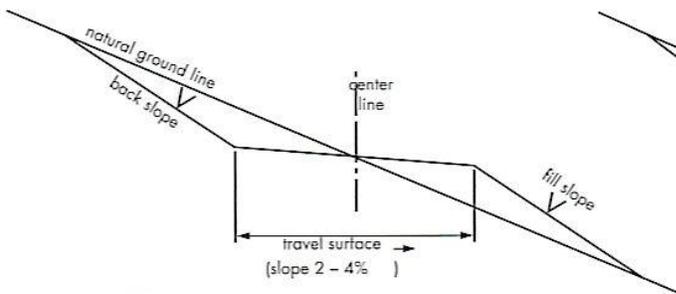
Typical Turnout Plan



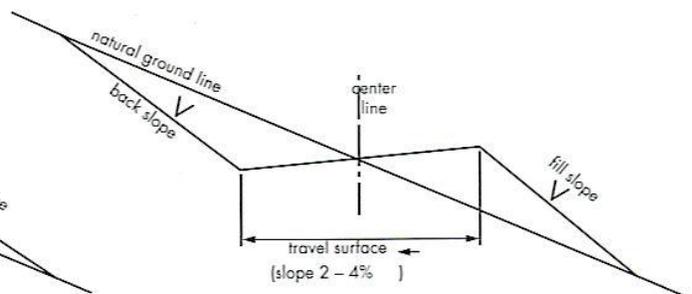
Embankment Section



Side Hill Section



Typical Outsloped Section



Typical Insloped Section

V. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

1. Chaves County;

Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201, 24 hour at (575) 627-0205. The BLM is to be notified a minimum of 4 hours in advance for a representative to witness:

- a. Spudding well
- b. Setting and/or Cementing of all casing strings
- c. BOPE tests

2. A Hydrogen Sulfide (H₂S) Drilling Plan should be activated 500 feet prior to drilling into the San Andres formation.

3. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

4. When floor controls are required, (3M or Greater) controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

5. Gamma-Ray/Neutron logs shall be run from the base of the Salado formation to the surface. The logs shall be run at a speed which allows the logs to be legible and no faster than manufactures of the logging tools recommended speed. (R-111-P area only)

B. CASING

1. The 13 ³/₈ inch surface casing shall be set at 200 feet or 25 Ft. into the top of the Rustler Anhydrite and cemented to the surface.

a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with a surface log readout will be used or a cement bond log shall be run to verify the top of the cement.

b. Wait on cement (WOC) time for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compression strength, whichever is greater. (This is to include the lead cement).

c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compression strength, whichever is greater.

- d. If cement falls back, remedial action will be done prior to drilling out that string.
2. The minimum required fill of cement behind the 8 5/8 inch intermediate casing is to circulate to surface. If cement does not circulate see B.1.a-d above.
3. The minimum required fill of cement behind the 5 1/2 inch production casing is to tie back into the 8 5/8 inch intermediate casing by at least 200 ft.
 - a. If cement does not circulate, contact the appropriate BLM office for approval of remedial action.
 - b. If cement is required to tie-back into previous casing string, a temperature survey utilizing an electronic type temperature survey with a surface log readout will be used or a cement bond log shall be run to verify the top of the cement.
4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be 2000 (2M) psi.
 - a. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - b. The tests shall be done by an independent service company.
 - c. The results of the test shall be reported to the appropriate BLM office.
 - d. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
 - e. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug.
 - f. BOP/BOPE must be tested by an independent service company prior to drilling out of the 8 5/8 inch shoe.

g. A variance to test the surface casing and BOP/BOPE to the reduced pressure of 1000 psi with the rig pumps is approved.

VI. PRODUCTION

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities

Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

Containment Structures

The containment structure shall be constructed to hold the capacity of the entire contents of the largest tank, plus 24 hour production, unless more stringent protective requirements are deemed necessary by the Authorized Officer.

A containment structure or earthen dike shall be constructed and maintained around the north, east, and west outside boundary of the well pad. The containment structure or earthen dike shall be constructed two (2) feet high (the containment structure or earthen dike can be constructed higher than the two (2) feet high minimum). The containment structure or earthen dike is required so that if oilfield waste contaminant or product contaminant were leaked, spilled, and or released upon the well pad the oilfield waste contaminant or product contaminant shall be contained in order to prevent the contaminant from entering into the drainage located north of the well pad location.

Painting Requirement

All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, Olive Drab, Munsell Soil Color Chart 18-0622 TPX.

VII. INTERIM RECLAMATION

A. INTERIM RECLAMATION

If the well is a producer, interim reclamation shall be conducted on the well site in accordance with the orders of the Authorized Officer. The operator shall submit a Sundry Notices and Reports on Wells (Notice of Intent), Form 3160-5, prior to conducting interim reclamation.

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.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche may be used in road repairs, fire walls or for building other roads and locations. In addition, in order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

B. SEED MIXTURE

The operator shall work with BLM surface management specialists to devise the best strategies to reduce the size of the location. Any reductions should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

The reclamation shall include recontoured, all trash removed, and reseeded as follows:

PECOS DISTRICT, BLM
SEED MIX FOR
Shallow SD-3 Ecological Site & Very Shallow, CP-4 Ecological Site

Common Name and Preferred Variety	Scientific Name	Pounds of Pure Live Seed Per Acre
Blue grama	<i>(Bouteloua gracilis)</i>	3.00 lbs.
Or Black grama	<i>(B. eriopoda)</i>	
Sideoats grama	<i>(Bouteloua curtipendula)</i>	2.00 lbs.
New Mexico Feathergrass	<i>(Stipa neomexicana)</i>	1.00 lb.
Or Green sprangletop	<i>(Leptochloa dubia)</i>	
Desert or Scarlet	<i>(Sphaeralcea ambigua</i>	1.00 lb.
Globemallow	<i>or S. coccinea)</i>	
Croton	<i>(Croton spp.)</i>	1.00 lb.
Buckwheat	<i>(Eriogonum spp.)</i>	<u>1.00 lb.</u>
TOTAL POUNDS PURE LIVE SEED (pls) PER ACRE		9.00 lbs.

Certified Weed Free Seed. If one species is not available. Increase ALL other proportionately. Use no less than four (4) species, including one (1) forb. No less than 9 pounds pls per acre shall be applied.

VIII. FINAL ABANDONMENT & REHABILITATION REQUIREMENTS

Upon abandonment of the well and/or when the access road is no longer in service the Authorized Officer shall issue instructions and/or orders for surface reclamation and restoration of all disturbed areas.