



United States  
Department of  
Agriculture

FOREST SERVICE

DELTA, COLORADO



# FINAL OIL AND GAS LEASING ENVIRONMENTAL IMPACT STATEMENT

GRAND MESA,  
UNCOMPAHGRE  
AND GUNNISON  
NATIONAL FORESTS

## SUMMARY



APRIL 1993



Cooperating Agency  
USDI BUREAU OF LAND MANAGEMENT



United States  
Department of  
Agriculture

Forest  
Service

Grand Mesa, Uncompahgre and  
Gunnison National Forests

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Reply to: 2820

Date: APR 2 1986

Dear Reader:

Enclosed is a copy of the summary for the Final Oil and Gas Leasing Environmental Impact Statement for the Grand Mesa, Uncompahgre and Gunnison National Forests. This is being sent to you because of interest you have expressed either in response to our annual mailing list updates or through your direct participation in this process.

Also enclosed is the Record of Decision which discusses the decisions I have made and the selected alternative.

If you would like to have a copy of the Final EIS please contact:

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Thank you for your participation in the analysis process.

Sincerely,

ROBERT L. STORCH  
Forest Supervisor





# Summary



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A stipulation for Major Trails was added to Appendix C; the stipulation displayed in Appendix D is new; information was added to the RFD in Appendix E; and Appendices K through O were added to the document.

Appendix K is a Table of Required Permits (before drilling).

Appendix L lists existing oil and gas leases as of 2/11/93.

Appendix M is the Forest's Oil and Hazardous Spill Contingency Plan.

Appendix N is the Biological Assessment (Threatened, Endangered, and Proposed species).

Appendix O is the Biological Evaluation (sensitive species and species of concern).

## **Forest Service Minerals Management Policy**

The Federal Onshore Oil and Gas Leasing Reform Act (FOOGLRA or the Leasing Reform Act) of 1987 authorized the Secretary of Agriculture to develop procedures and regulations governing leasing for oil and gas resources, including bonding and reclamation requirements, within the National Forest System (NFS). This authority was formerly exercised by the United States Department of Interior (USDI) Bureau of Land Management (BLM). Regulations governing the role of the Forest Service in oil and gas leasing operations on NFS lands were issued March 20, 1990 (36 CFR 228 Subpart E).

The Forest Service administers its mineral program to (from FSM 2802):

- "1. Encourage and facilitate the orderly exploration, development, and production of mineral and energy resources within the National Forest System in order to maintain a viable, healthy minerals industry and to promote self-sufficiency in those mineral and energy resources necessary for economic growth and the national defense.
2. *Ensure that exploration, development, and production of mineral and energy resources are conducted in an environmentally sound manner and that these activities are considered fully in the planning and management of other National Forest resources.*
3. *Ensure that lands disturbed by mineral and energy activities are reclaimed for other productive uses."*

Similarly, from FSM 2822.03: *"The Forest Service considers mineral exploration and development to be important parts of its management program. It cooperates with the Department of Interior (USDI) in administering lawful exploration and development of leasable minerals. While the Forest Service is mainly involved with surface resource management and protection, it recognizes that mineral exploration and development are ordinarily in the public interest and can be compatible in the long term, if not immediately, with the purposes for which the National Forest System lands are managed."*

## **Current Situation**

As a result of the Leasing Reform Act, the Rocky Mountain Region (R2) of the Forest Service withdrew consent previously given to the BLM to make lease offerings on October 26, 1988. Oil and gas

**Final Environmental Impact Statement  
Oil and Gas Leasing Analysis  
Grand Mesa, Uncompahgre and Gunnison  
National Forests  
April 1993**

## **Summary**

### **Introduction**

The purpose of this Final Environmental Impact Statement (FEIS) is to evaluate the potential effects of alternative programs for oil and gas leasing on the Grand Mesa, Uncompahgre and Gunnison National Forests; to amend the Land and Resource Management Plan (Forest Plan) to adequately address availability of lands for oil and gas leasing; to provide direction to implement the leasing decisions; and to give the interested public an opportunity to participate in the process and comment on the proposal. The alternatives range from *No Lease* to *No Action* to *Lease with Standard Lease Terms*.

### **Changes Made Between Draft and Final**

Numerous changes have been made to the Draft Oil and Gas Leasing EIS to reflect the comments we received from the public and other agencies, to supplement the information disclosed in the Draft, to update information that has changed in the past months, and to correct typographical and grammatical errors. The discussion below highlights the major changes to the document. Other changes are pointed out, as necessary, in the Response to Comments in Chapter VI.

In Chapter I, information on the current situation has been updated, a discussion of a most development scenario was added to the section on the Reasonably Foreseeable Development (RFD) scenario, and clarification of discussions were added based on public comment. It should also be noted that all leases now have a ten year term as a result of language included in the Energy Policy Act of 1992.

In Chapter II, Alternative 2 - Preferred was revised. The Whetstone Mountain, Flat Top Mountain and portions of the Priest Mountain Roadless Areas, and the Kebler Pass corridor (which includes portions of the West Elk and Raggeds Roadless Areas) have been added to the list of areas not available for oil and gas leasing. A discussion of recreation use and opportunities was added to the Alpine/Tundra environmental consequence table and Figures II-1 through II-5 were clarified by displaying Standard Lease Terms in yellow.

In Chapter III, the air quality discussion was revised and several maps were updated, revised, and added as needed.

In Chapter IV, the air quality environmental consequences section was revised; sections on the impacts to State Highways and to recreation use and opportunities in Alpine/Tundra were added; Table IV-4 which displays the lease options by Roadless Area was added; and further discussions of coal bed methane and the potential for timber harvest and cumulative effects are included in this FEIS.

In Chapter VI, Response to Comments were added.

leasing was suspended on five National Forests in R2, including the Grand Mesa, Uncompahgre and Gunnison. A review of the Forest's Land and Resource Management Plan (Forest Plan) and associated environmental documents indicated that additional documentation was needed to fully support Forest Service leasing consent decisions in accordance with the Leasing Reform Act. The Forest Plan predates the Leasing Reform Act and contains only general management direction for oil and gas exploration and development.

This Forest has existing oil and gas leases that cover approximately 185,000 acres, with the majority of the leases concentrated on the north end of the Forest. The existing leases and their administration will not be affected by this analysis. In fiscal year 1992 (FY 92), the Forest had seven wells actively producing natural gas. All were located on the Paonia Ranger District. The seven wells produced a total of 400,000 thousand cubic feet (MCF) of natural gas and 1132 barrels of oil in FY 92.

## Decisions to be Made

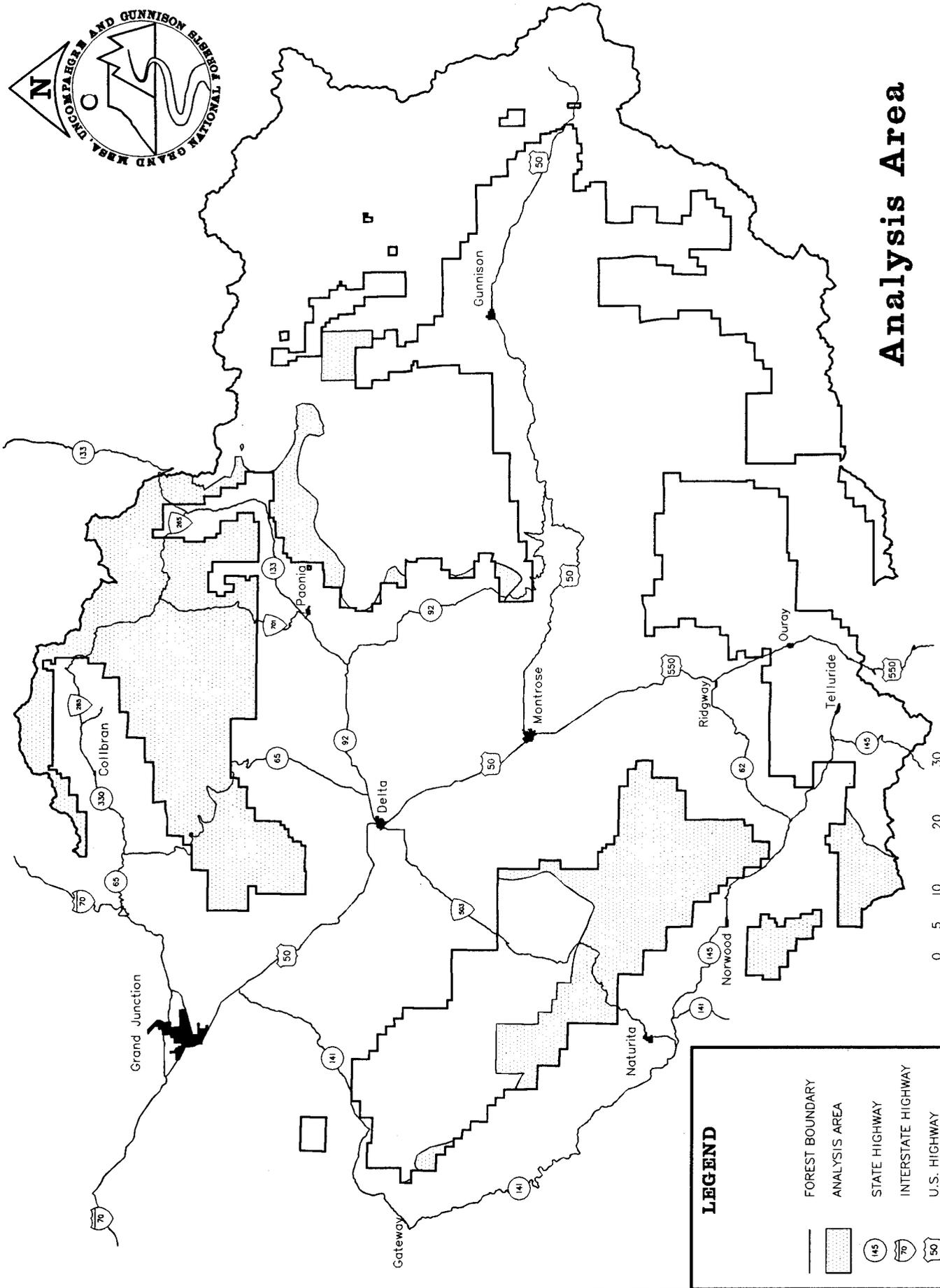
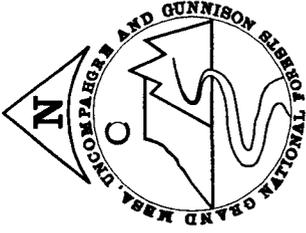
Regulations prescribe Forest Service responsibilities in the issuance of Federal oil and gas leases and the management of subsequent oil and gas operations on NFS lands (36 CFR 228.100(a)). These regulations (36 CFR 228.102(c)) require the authorized Forest officer (in this case, the Forest Supervisor) to conduct a *Leasing Analysis* that:

- (1) *Identifies on maps those areas that will be:* (emphasis added)
  - i. *Open to development subject to the terms and conditions of the standard oil and gas lease form (including an explanation of the typical standards and objectives to be enforced under the standard lease terms);*
  - ii. *Open to development but subject to constraints that will require the use of lease stipulations such as those prohibiting surface use on areas larger than 40 acres or such other standards as may be developed in the plan for stipulation use (with discussion as to why the constraints are necessary and justifiable); and*
  - iii. *Closed to leasing, distinguishing between those areas that are being closed through exercise of management direction, and those closed by law, regulation, etc.*
- (2) *Identifies alternatives to the areas listed above, including that of not allowing leasing.*
- (3) *Projects the type / amount of post-leasing activity that is reasonably foreseeable as a consequence of conducting a leasing program consistent with that described in the proposal and for each alternative.*
- (4) *Analyzes the reasonable foreseeable impacts of projected post-leasing activity.*

This FEIS documents the *Leasing Analysis* for the Grand Mesa, Uncompahgre and Gunnison National Forests. The regulations require *Leasing Analyses* to comply with the National Environmental Policy Act (NEPA) of 1969, implementing regulations at 43 CFR 1500-1508 and Forest Service implementing policies and procedures set forth in Forest Service Manual 1950 and Forest Service Handbook 1909.15 (36 CFR 228.102(a)).

The *Leasing Analysis* will result in three decisions:

- 1. Identify which lands, if any, will be administratively available for leasing to private individuals or firms and the stipulations that must be applied to their respective leases.**



# Analysis Area

Figure S-1

Drawn By: DAF 7/98

**2. Identify which of the lands that are administratively available, if any, the BLM will be authorized to lease - subject to later review of the identified lease parcel and consent by the Forest Service.**

**3. Amend the Forest Plan to reflect the leasing decisions that have been made.**

Upon completion of the *Leasing Analysis*, the Forest Service shall promptly notify the BLM that Forest-wide leasing decisions have been made. These decisions will be displayed in the Record of Decision (ROD) that will accompany the FEIS. The BLM, responsible for the management of all Federally-owned leasable minerals, may offer and lease National Forest System (NFS) lands authorized for leasing in the ROD.

## **Lands Involved**

The lands involved in the *Leasing Analysis* are located in west-central Colorado and comprise the Grand Mesa, Uncompahgre and Gunnison National Forests (see map Fig. S-1). The Grand Mesa and Uncompahgre National Forests were administratively combined in 1954 and the Gunnison was added in 1973 for a total 2,953,186 acres of National Forest System land. The Forest includes portions of Delta, Garfield, Gunnison, Hinsdale, Mesa, Montrose, Ouray, Saguache, San Juan, and San Miguel Counties.

Direction for *Leasing Analyses* issued by the Chief's office (Interim Directive 2820-91-1; January 2, 1992), states that Forest's should give priority to areas of the Forest in which there is interest in leasing (FSM 2822.94a). The direction defines interest in leasing as:

1. *An interest in leasing has been expressed by the oil and gas industry;*
2. *There has been oil and gas production nearby;*
3. *The geologic environment is favorable for oil and gas to have accumulated;*
4. *There are State, private, or Federal leases in the vicinity;*
5. *Geophysical exploration has been done recently; or*
6. *The BLM indicates that lands have been nominated for lease.*

Based on this direction, the analysis area covered in this FEIS includes those areas of high and moderate potential for oil and gas resources and those areas of low and no known potential for oil and gas resources that are currently leased.

The analysis area contains approximately 951,450 acres. No other NFS lands have been formally withdrawn from mineral leasing. (Wilderness, Wilderness Study Areas and further planning areas are legally unavailable for leasing [36 CFR 228.102(b)(3)], however, there are none within the analysis area.) An amendment to the regulations removed the exclusion of some Roadless Areas from oil and gas *Leasing Analysis* (published in the Federal Register 11/1/91). The intended effect is to enable the Forest Service to include Roadless Areas in oil and gas *Leasing Analyses*.

## **Public Involvement and Scoping**

The Forest Service invited written comments concerning this *Leasing Analysis*, in a Notice of Intent to Prepare an Environmental Impact Statement, published in the Federal Register, Volume 55, No. 207, Thursday, October 25, 1990. The Notice of Intent also announced an open house to be held November 14, 1990 in Montrose, Colorado.

The Montrose open house and two other meetings were announced in the Montrose Daily Press, the Grand Junction Sentinel, and the Delta County Independent. Meetings were held in Montrose on November 14, 1990; in Paonia, Colorado on November 28, 1990; and in Grand Junction, Colorado on December 5, 1990. In addition to the public meetings, a meeting was held with the Delta County Commissioners on December 17, 1990. A second round of open house meetings were conducted April 7, 8 and 9, 1992, in Grand Junction, Paonia and Montrose, Colorado.

The Draft EIS was published in August, 1992. Four open houses were held on September 2, 3, 8 and 10, 1992, in Grand Junction, Paonia, Denver and Montrose, respectively, to discuss the DEIS with interested publics. Forest Service representatives also met with members of Western Colorado Congress on September 16, 1992, in Montrose, and the Forest Rescue group in Crested Butte, Colorado, on September 24, 1992.

The public comment period extended from August 17, 1992 through October 13, 1992. The Forest received 270 letters from various individuals, industry, environmental groups, local, State and Federal agencies.

The scoping process helped to identify the issues involved in oil and gas leasing activities. The responses from the public, along with internal agency concerns discussed during scoping meetings were used to formulate and define the pertinent issues.

## **The Major Issues**

The ID team identified five major issues. These issues will be used to compare the effects that implementation of an alternative will have on the environment relative to that of another alternative. They are:

1. Slope stability and geologic hazards.
2. Roadless and undeveloped areas.
3. Wildlife and wildlife habitat.
4. Recreational activities and experiences.
5. Impacts to wildlife, fisheries, watershed values, timber and oil and gas resources.

## **Analysis Process**

### **Affected Environments**

Within the analysis area there are a number of land categories, each of which suggests a different management strategy, or decision, in terms of oil and gas leasing. Based on public comments and/or Interdisciplinary Team concerns, the following *Affected Environments* were identified:

<b>TABLE S-1. AFFECTED ENVIRONMENTS WITHIN ANALYSIS AREA</b>	
<b>Affected Environment</b>	<b>Acres*</b>
General Forest (Analysis Area)	951,450
Floodplains	10,200
Aquatic/Riparian/Wetland Habitats	27,600
Alpine/Tundra Areas	2,100
High Geologic Hazard Areas	52,000
Moderate Geologic Hazard Areas	629,000
Roadless Areas	345,030
Research Natural Areas	655
Sensitive Areas	29,000
Retention VQO	7,800
Retention VQO and Low VAC	7,210
Scenic Byway Corridors	18,140
Semi-primitive Non-motorized (3A Management Areas)	13,700
Administrative Sites	35
Recreation Complexes (Developed, Dispersed, Trails)	62,975
Watersheds of Special Interest to Municipalities	117,000
Slopes 40-60%	33,530
Slopes > 60%	3,415
Big Game Winter Range	207,450
Elk Calving Areas	45,230
Big Game Migration Routes and Staging Areas	N/A**
Bighorn Sheep Lambing and Breeding Areas	9335

<b>TABLE S-1. AFFECTED ENVIRONMENTS WITHIN ANALYSIS AREA</b>	
<b>Affected Environment</b>	<b>Acres*</b>
Big Game Summer Range (Concentrated Use)	81,440
Sage Grouse Leks	160
Utility Corridors/Electronic Sites	4535
Primary Rangeland (6B Management Areas)	395,000
Lands Suited for Timber Harvest	287,000

\*Note: Many of these environments overlap. Acreages do NOT add up to the analysis area total.  
 \*\*Only general areas have been identified at this time.

Each of these *Affected Environments* has been inventoried, mapped and digitized for the purpose of this analysis, and are described in Chapter III - Affected Environment, of the FEIS.

## Environmental Analysis

In this case, we used a **Two Step Analysis Process** to support our decision-making. First, we analyzed the environmental consequences of each of the lease options on each of the *Affected Environments* listed above. Lease options include:

- No Lease
- No Surface Occupancy
- Controlled Surface Use
- Timing Limitations
- Standard Lease Terms

Then, we analyzed the environmental consequences of alternative Forest programs. (The sum of all individual *Affected Environment* decisions add up to a program.)

## How the Reasonably Foreseeable Development (RFD) Fits In

The Reasonably Foreseeable Development Scenario (RFD) predicts the level of oil and gas exploration and development which will occur on the Forest in the next 15 years. This information is important in assessing the overall environmental, as well as social and economic impacts of such development. Under the possible different programs represented by Alternatives 1 through 5, it is conceivable that more or less oil and gas activity would occur. Under the more restrictive Alternatives (3 & 5), the industry may choose to divert their activities elsewhere in the Forest, the State, or even the world.

The RFD does not suggest specific locations of potential wells beyond indicating a general area of anticipated occurrence (such as 5 wells in the area of moderate potential for oil and gas resources). Thus the RFD does not provide a basis for site specific discussion of environmental consequences. At the first level of our analysis we are deciding whether a given *Affected Environment* is available and authorized for lease. That means we must have considered the hypothetical siting of a well and access on each acre that we find suitable for leasing and we must have considered the environmental effects.

## Analysis Assumptions

Analysis assumptions were developed for use in determining the scope of the environmental consequences of oil and gas development activities. The assumptions were developed to describe the effects of the RFD by using data from past oil and gas activities on the Grand Mesa, Uncompahgre and Gunnison National Forests along with guidelines issued in the "Surface Operating Standards for Oil and Gas Exploration and Development--Gold Book" publication.

1. Drilling activity within the Forest will continue at the same conservative levels of 1986 to 1990, and constitute about 3% of the regional activity.

2. Projected well distribution throughout the Forest is:

**Grand Mesa National Forest** - 12 wells; Six of which will be completed for production. Seven of the 12 wells will be in high potential and five will be located in the moderate potential areas. Eight of the 12 wells will be drilled on existing leases. Four of the 12 wells will be drilled on new leases.

**Gunnison National Forest** - 12 wells; Six of which will be completed for production. All of these wells will be located in high potential areas. Two of these wells will be on Petro-Energy's existing lease C-30465. Two wells will be drilled on new leases.

**Uncompahgre National Forest** - 3 wells; One of which will be completed for production. All three of these wells will be located in the high potential areas and one of them will be on new leases.

**Areas under Unit Agreements** - 20 wells. There are two exploratory units with predicted activity within the analysis area. A 90% success rate is projected in these units. The units with projected activity are listed below:

- (1) Narrows - Gunnison National Forest - 10 wells.
- (2) Ragged Mountain - Gunnison National Forest - 10 wells.

**Forty-seven (47) wells are projected on the Forest over the next 15 years.**

3. Forty-two (42) of the projected wells will be drilled in areas of high potential for oil and gas resources. Five will be drilled in moderate potential. Of the 47 wells predicted to be drilled over the next 15 years, 40 are expected on existing leases.

**Only seven (7) wells are predicted to be drilled on new leases.**

The number of wells drilled on existing leases (not subject to the decisions made in this EIS until the lease expires, is relinquished, or is terminated) is constant. Also, the number of wells drilled on new leases is the same with the exception of Alternative 3 - No Lease. Assume that the location of the seven wells on new leases will shift to those areas where the stipulations are less restrictive, by alternative.

4. A typical well will disturb approximately 10.7 acres.

5. **Total projected disturbance is estimated to be 503 acres.**

## Connected Actions

In selected areas, oil and gas development is likely to lead to additional activities which also need to be considered in making a decision to allow or not allow such development. These are connected

actions, which although not a part of the original purpose for development, may reasonably follow as a result of the development. In the case of oil and gas development the greatest opportunity for this kind of cause and effect is in the development of roads into areas which are not now roaded. This could provide access to timber stands which would otherwise be uneconomical to reach. This in turn provides the opportunity to harvest more timber than would otherwise occur.

## **Descriptions of Alternatives**

The range of alternatives are described below. Narrative descriptions are followed by Table S-2, which identifies each lease option that will apply for a given *Affected Environment*; Table S-3 lists the acres of each lease option for each alternative; and Figures S-2 through S-6 are maps of the lease option combinations, by alternative.

### **Alternative 1 - No Action**

The No Action alternative is required by NEPA regulations. The No Action alternative is "*current management in accordance with the Forest Plan*". The Forest Plan specifies different lease stipulations for the different *Affected Environments*. Table S-2 displays the lease stipulations specified by the current Forest Plan for each of the *Affected Environments*.

The Forest Plan does not specifically address all the *Affected Environments* as delineated in this FEIS. Some interpretation of the Forest Plan was necessary to determine which stipulation may apply to a specific *Affected Environment*.

With this alternative, all of the analysis area would be available for oil and gas leasing. Floodplains, Alpine/Tundra Areas, Research Natural Areas, Sensitive Areas, Retention VQO, Scenic Byway Corridors, 3A Management Areas, Recreation Complexes (dispersed and developed sites), Watershed of Special Interest to Municipalities, and Slopes 40-60% would have *Controlled Surface Use* stipulations attached to the lease.

### **Alternative 2 - Preferred**

This alternative makes some of the legally available land in the analysis area not available for oil and gas leasing. Those areas with *No Lease* include the Kannah Creek, Tabeguache, and Roubideau Roadless Areas. These Roadless Areas have been mentioned in recent Wilderness legislation. Additionally, the proposed Tabeguache Research Natural Area, Whetstone Mountain, Flat Top Mountain, and parts of West Elk (Snowshoe Mesa, Kebler Pass), Raggeds (Kebler Pass) and Priest Mountain (Flat Tops, et al.) Roadless Areas would not be available for leasing.

The Battlement Mesa Roadless Area would be leased, but with *No Surface Occupancy* stipulations. Other resource concerns within Roadless Areas may effectively protect some of the roadless values, i.e., Slopes over 60% in Roadless Areas would have the *No Surface Occupancy* stipulation attached to the lease.

Areas protected with *No Surface Occupancy* under this alternative include: Sensitive Areas, Alpine/Tundra Areas, Floodplains, areas of Retention VQO and Low VAC, 3A Management Areas, Recreation Complexes (developed and dispersed sites), Administrative Sites, Slopes over 60%, Summer Range (Concentrated Use), Bighorn Sheep Lambing and Breeding Areas, and Sage Grouse Leks.

Resources protected with *Timing Limitations* and *Controlled Surface Use* stipulations include: areas with Moderate Geologic Hazards, Retention VQO, Scenic Byway Corridors, Major Ski Trails, Slopes 40-60%, and the nesting area around a Sage Grouse Lek.

Table S-2 displays the option the decision maker has chosen for each of the *Affected Environments*.

### **Alternative 3 - No Lease**

With the selection of this alternative, none of the Forest would be administratively available for oil and gas leasing. The Forest would not authorize the BLM to lease the oil and gas resources underlying the Forest. The selection of this alternative would not affect existing leases. However, should an existing lease expire, the parcel would not be available for future leasing. This alternative, since it represents the least potential for ground disturbance also constitutes the environmentally preferred alternative. Note also, that even if this alternative is chosen, environmental consequences may still occur from those activities on existing leaseholds.

This alternative is required by the Forest Service oil and gas regulations (36 CFR 228.102(c)(2)). This alternative represents the most restrictive alternative to the oil and gas industry.

### **Alternative 4 - Lease with Standard Lease Terms**

With the selection of this alternative, all legally available lands would be subject to oil and gas leasing with standard lease terms. The Forest would authorize the BLM to offer for lease all unleased Federal oil and gas underlying the Forest, within the analysis area (defined in Lands Involved, pages S-5).

This alternative represents the least restrictive alternative to the oil and gas industry.

### **Alternative 5 - No Lease in Roadless and SPNM**

Roadless Areas and areas with a Semi-primitive Non-motorized ROS as a management prescription (3A) in the Forest Plan, would not be administratively available for oil and gas leasing. The goal of this alternative is to protect the roadless character of Roadless Areas and to maintain the Semi-primitive Non-motorized recreation opportunity on the Forest. Some of the current Roadless Areas and 3A Management Areas are currently leased. The character of those Roadless Areas may change even if this alternative is chosen.

This alternative is the same as Alternative 2, except in its treatment of Roadless Areas and 3A Management Areas (Semi-primitive Non-motorized ROS by Forest Plan management prescription). All Roadless Areas and 3A Management Areas would not be available for leasing. If existing leases in Roadless Areas and 3A Management Areas expire or are relinquished, they would not be available for leasing for the life of this EIS.

**Table S-2. DISPLAY OF ALTERNATIVES**

AFFECTED ENVIRONMENT	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
General Forest	SLT	SLT	NL	SLT	SLT
Floodplains *	CSU	NSO	NL	SLT	NSO
Aquatic/Riparian/Wetland Habitats *	CSU	NSO	NL	SLT	NSO
Alpine/Tundra Areas	CSU	NSO	NL	SLT	NSO
High Geologic Hazard	NSO	NSO	NL	SLT	NSO
Moderate Geologic Hazard	CSU	CSU	NL	SLT	CSU
Roadless Areas:					
- Raggeds	NSO, CSU, TL, SLT	NL, NSO, CSU, TL, SLT	NL	SLT	NL
- Drift Creek	NSO, CSU, TL, SLT	NSO, CSU, TL, SLT	NL	SLT	NL
- Springhouse Park	CSU, TL, SLT	CSU, TL, SLT	NL	SLT	NL
- Electric Mountain	NSO, CSU, SLT	NSO, CSU, SLT	NL	SLT	NL
- Clear Creek	NSO, CSU, TL, SLT	NSO, CSU, TL, SLT	NL	SLT	NL
- Hightower	NSO, CSU, TL, SLT	NSO, CSU, TL	NL	SLT	NL
- Priest Mountain	NSO, CSU, TL, SLT	NL, NSO, CSU, TL, SLT	NL	SLT	NL
- Salt Creek	NSO, CSU, TL, SLT	NSO, CSU, SLT	NL	SLT	NL
- Battlement Mesa	NSO, CSU, TL, SLT	NSO	NL	SLT	NL
- Nick Mountain	NSO, CSU, SLT	NSO, CSU, TL, SLT	NL	SLT	NL
- Kannah Creek	NSO, CSU, TL	NL	NL	SLT	NL
- West Elk	NSO, CSU, TL, SLT	NL, NSO, CSU, SLT	NL	SLT	NL
- Whetstone Mountain	NSO, CSU, SLT	NL	NL	SLT	NL
- Flat Top Mountain	CSU	NL	NL	SLT	NL
- Roubideau	NSO, CSU, TL, SLT	NL	NL	SLT	NL
- Tabeguache	NSO, CSU, TL, SLT	NL	NL	SLT	NL
- Kelso Mesa	NSO, CSU, SLT	NSO, CSU, SLT	NL	SLT	NL
- Campbell Point	CSU, TL	CSU, TL	NL	SLT	NL
- Johnson Creek	NSO, CSU, TL	NSO, CSU, TL	NL	SLT	NL
Research Natural Areas	CSU	NL	NL	SLT	NL
Sensitive Areas	CSU	NSO	NL	SLT	NSO
Retention VQO - Low VAC	NSO	NSO	NL	SLT	NSO
Retention VQO	CSU	CSU	NL	SLT	CSU
Scenic Byway Corridors	CSU	CSU	NL	SLT	CSU
Semi-primitive Non-motorized (3A Management Areas)	CSU	NSO	NL	SLT	NL
Administrative Sites *	NSO	NSO	NL	SLT	NSO
Recreation Complexes	CSU	NSO	NL	SLT	NSO
Watersheds of Special Interest to Municipalities	CSU	CSU	NL	SLT	CSU

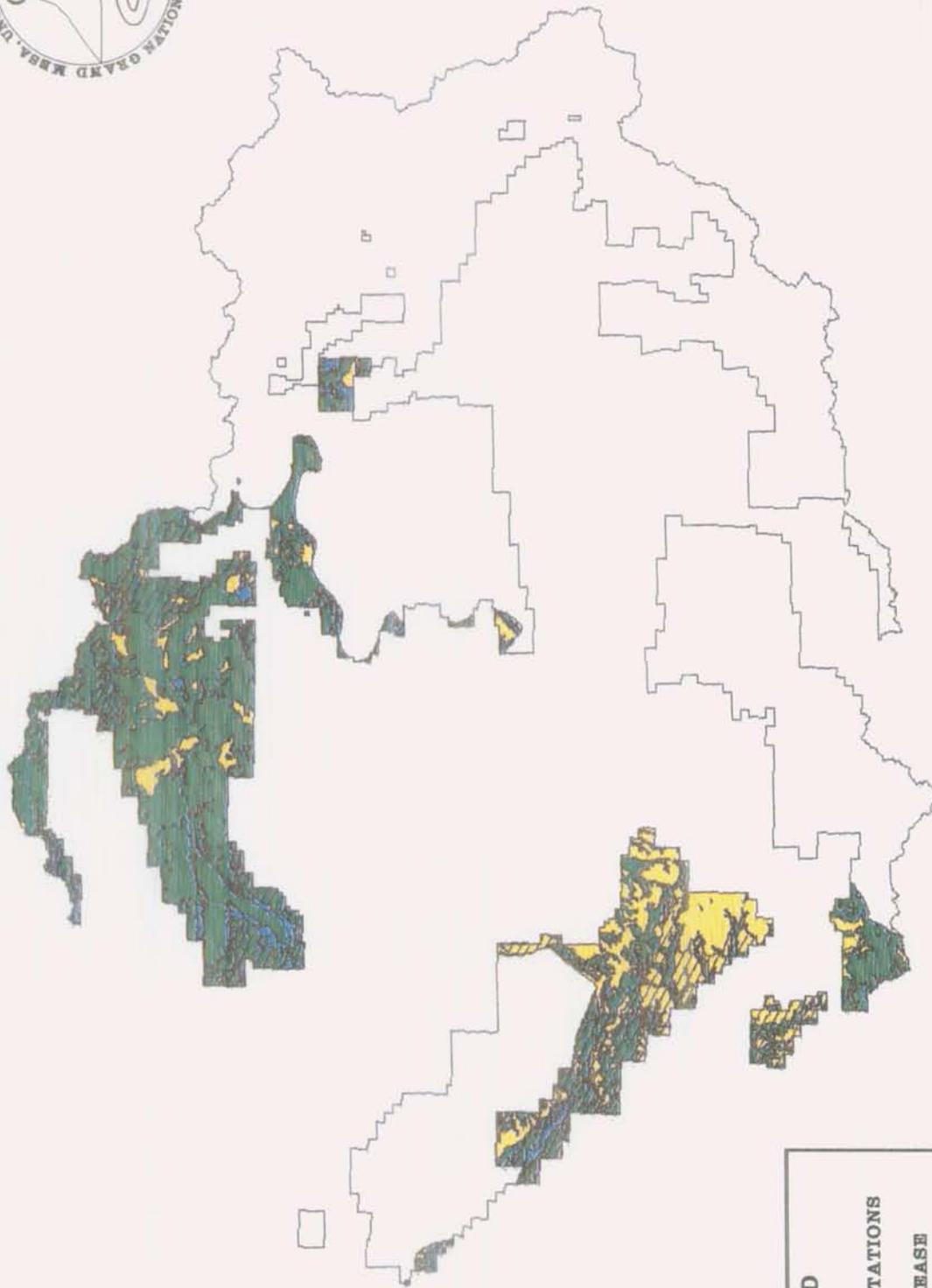
<b>AFFECTED ENVIRONMENT</b>	<b>Alternative 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4</b>	<b>Alternative 5</b>
Slopes 40-60%	CSU	CSU	NL	SLT	CSU
Slopes > 60%	NSO	NSO	NL	SLT	NSO
Wildlife Special Habitats: - Big Game Winter Range - Elk Calving Areas - Migration Routes & Staging Areas - Bighorn Lambing/Breeding Areas - Summer Range (Concentrated Use) - Sage Grouse Leaks	CSU, TL SLT SLT	CSU, TL CSU, TL CSU, TL	NL NL NL	SLT SLT SLT	CSU, TL CSU, TL CSU, TL
	TL, SLT	NSO	NL	SLT	NSO
	SLT SLT	NSO	NL	SLT	NSO
		NSO, CSU, TL	NL	SLT	NSO, CSU, TL
Threatened and Endangered Species*	Threatened and Endangered species are protected under the Endangered Species Act. Protective measures will be taken under all lease options.				
Utility Corridors - Electronic Sites *	NSO	SLT	NL	SLT	SLT
Primary Rangeland (6B Management Area)	SLT	SLT	NL	SLT	SLT
Lands Suited for Timber Harvest	SLT	SLT	NL	SLT	SLT

\* Not displayed on EIS maps because of sensitivity or size. NL = No Lease, NSO = No Surface Occupancy, CSU = Controlled Surface Use, TL = Timing Limitations, SLT = Standard Lease Terms.

Table S-3 summarizes by alternative, the acres of each lease option.

<b>TABLE S-3. ACRES OF LEASE OPTIONS BY ALTERNATIVE**</b>										
<b>LEASE OPTIONS</b>	<b>Alternative 1</b>		<b>Alternative 2</b>		<b>Alternative 3</b>		<b>Alternative 4</b>		<b>Alternative 5</b>	
	<b>Acres*</b>	<b>%</b>								
No Lease (NL)	0	0	138,270	15	951,450	100	0	0	349,150	37
No Surface Occupancy (NSO)	58,400	6	151,835	16	0	0	0	0	78,350	8
Controlled Surface Use (CSU)	463,600	49	215,170	23	0	0	0	0	130,250	14
Controlled Surface Use & Timing Limitations	202,350	21	239,755	25	0	0	0	0	202,950	21
Timing Limitations (TL)	81,600	9	80,440	8	0	0	0	0	77,950	8
Standard Lease Terms (SLT)	145,500	15	125,980	13	0	0	951,450	100	112,800	12

\* Analysis area = 951,450 acres. \*\* Acreages do not reflect existing leases.



**LEGEND**

	TIMING LIMITATIONS
	STANDARD LEASE TERMS
	NO LEASE
	NO SURFACE OCCUPANCY STIPULATIONS
	CONTROLLED SURFACE USE STIPULATIONS

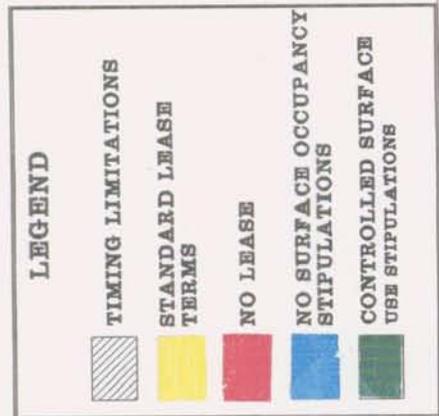
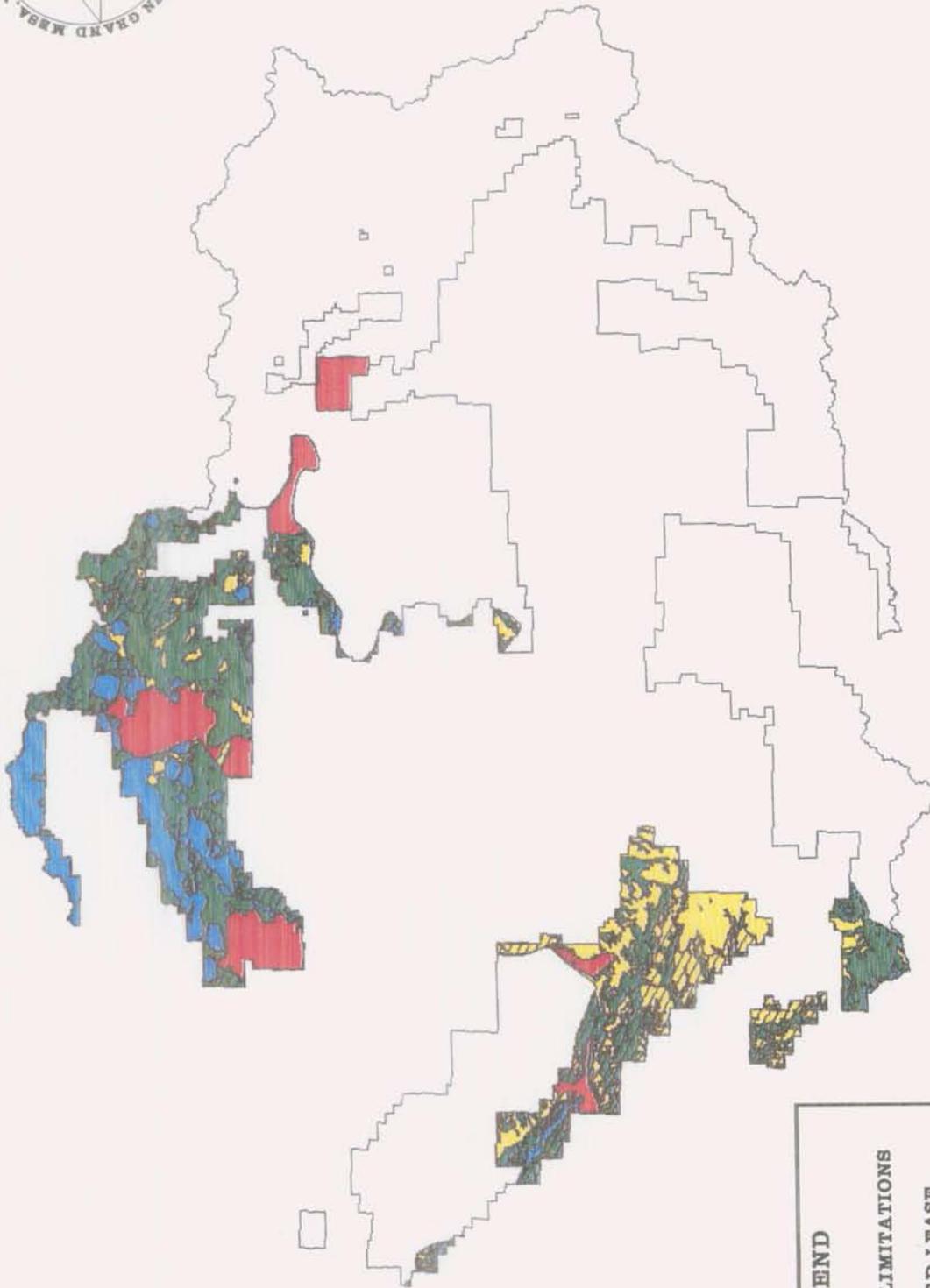
# Lease Options Within The Analysis Area For Alternative 1

Figure S-2

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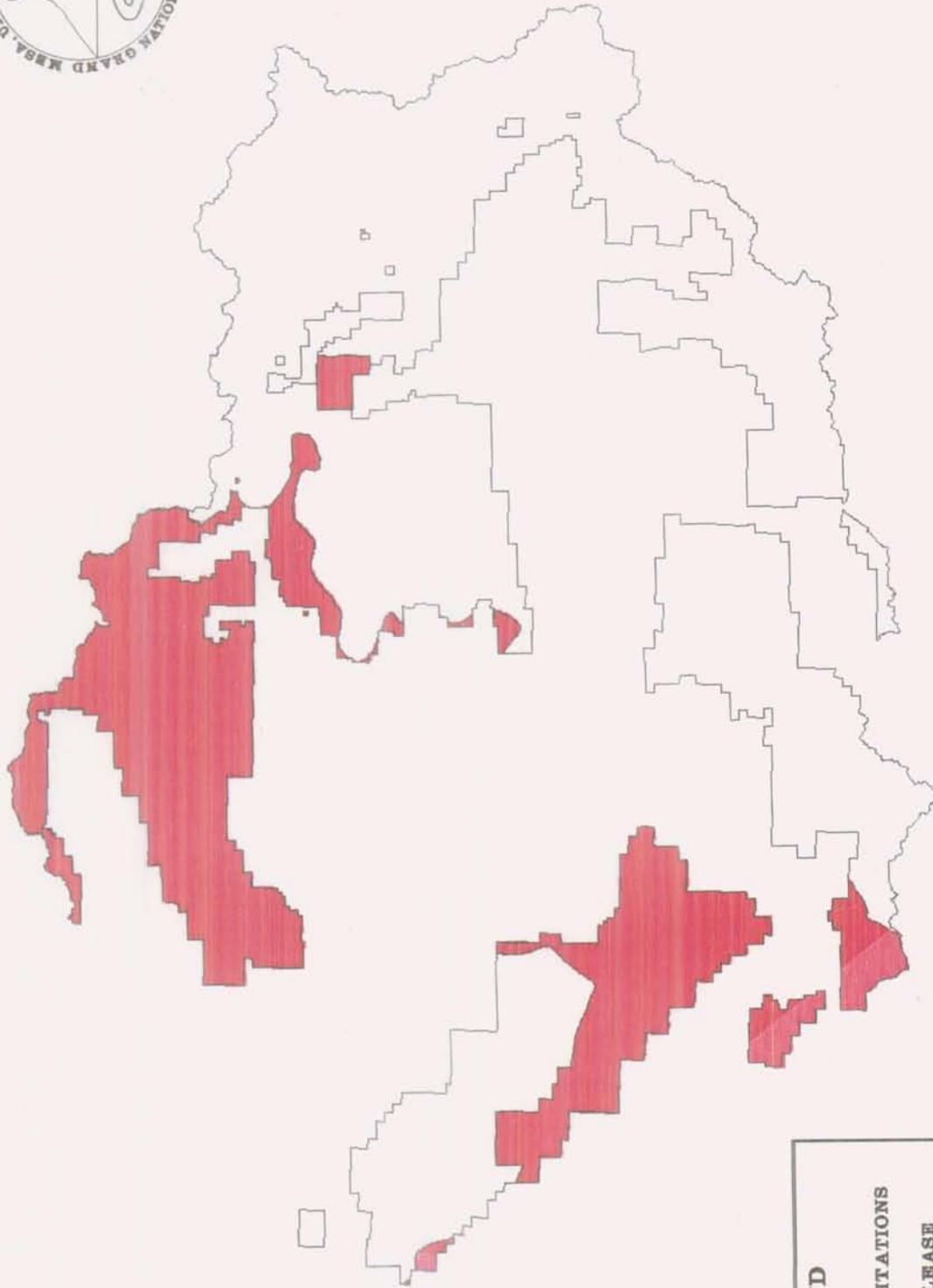
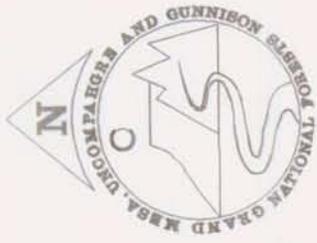
# Lease Options Within The Analysis Area For Alternative 2

Figure S-3

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DATE: 9/18/93

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**LEGEND**

	TIMING LIMITATIONS
	STANDARD LEASE TERMS
	NO LEASE
	NO SURFACE OCCUPANCY STIPULATIONS
	CONTROLLED SURFACE USE STIPULATIONS

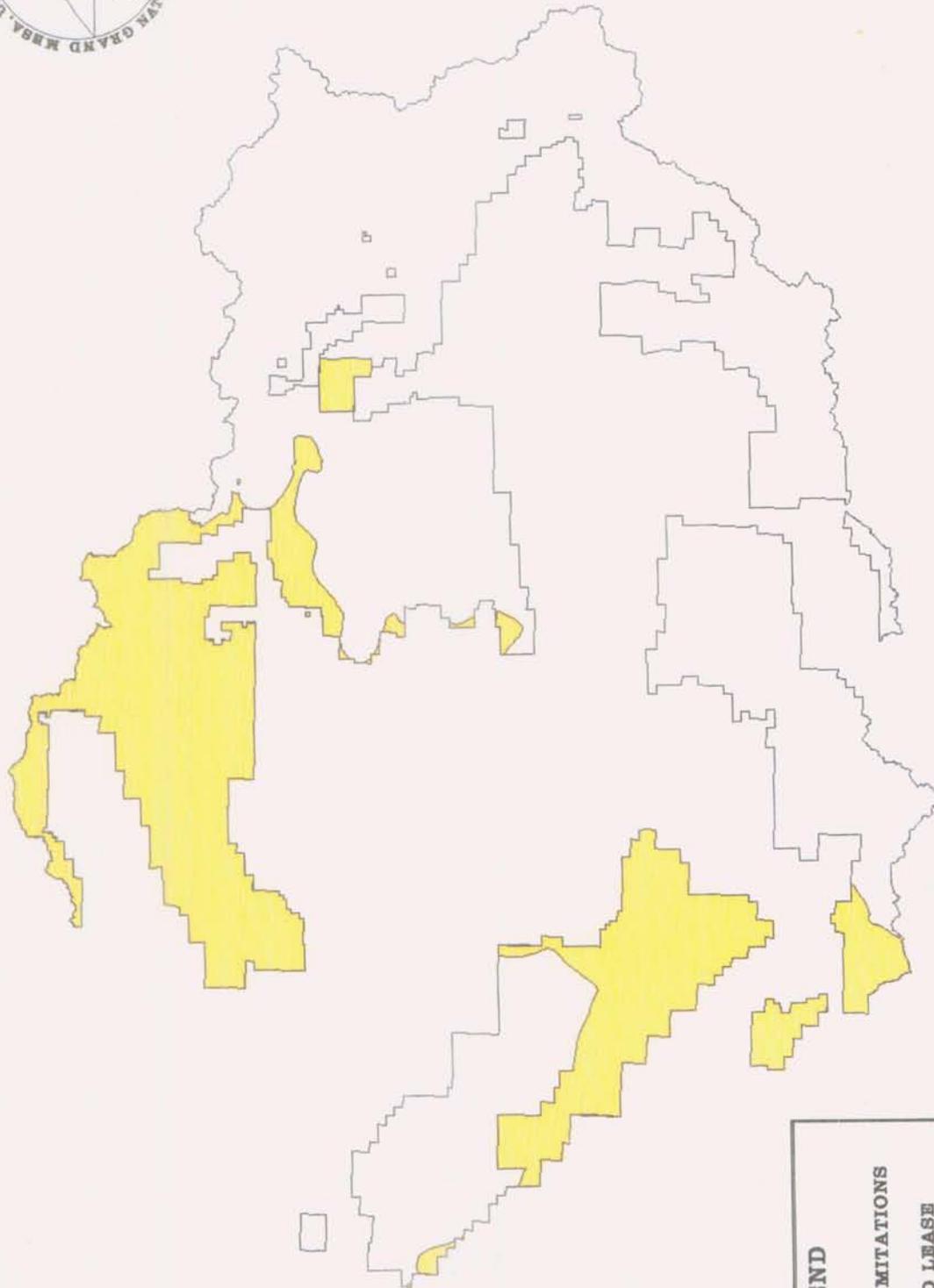
# Lease Options Within The Analysis Area For Alternative 3

Figure S-4

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DATE: 3/18/93

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**LEGEND**

-  TIMING LIMITATIONS
-  STANDARD LEASE TERMS
-  NO LEASE
-  NO SURFACE OCCUPANCY STIPULATIONS
-  CONTROLLED SURFACE USE STIPULATIONS

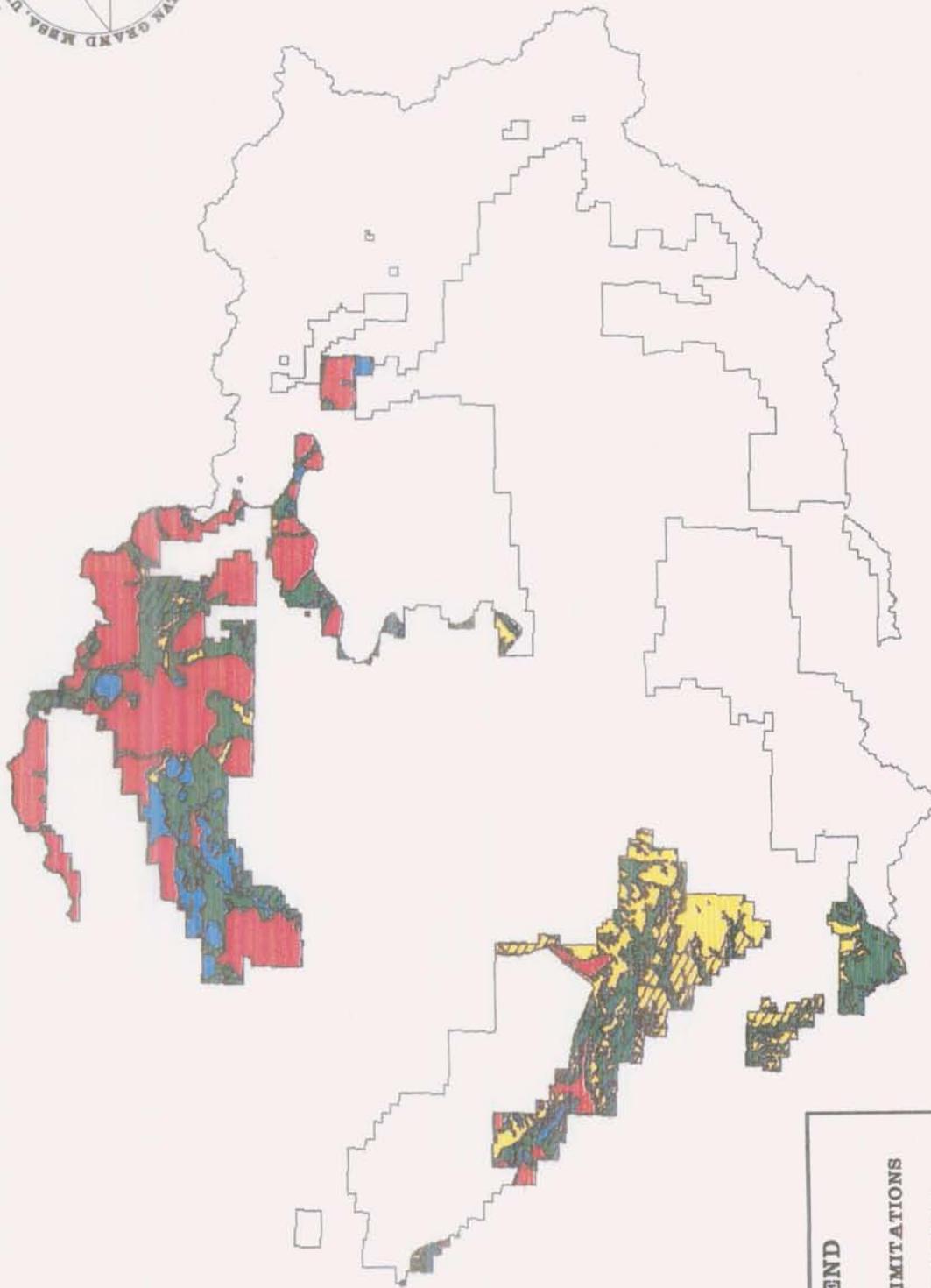
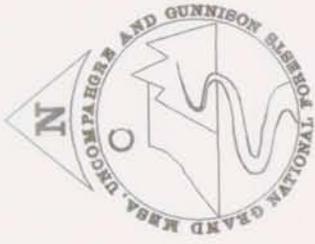
**Lease Options  
Within The Analysis  
Area For Alternative 4**

Figure S-5

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DATE: 8/18/98

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**LEGEND**

-  TIMING LIMITATIONS
-  STANDARD LEASE TERMS
-  NO LEASE
-  NO SURFACE OCCUPANCY STIPULATIONS
-  CONTROLLED SURFACE USE STIPULATIONS

**Lease Options  
Within The Analysis  
Area For Alternative 5**

Figure S-6

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DATE: 2/18/03

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## Alternative Consequences Summary

**TABLE S-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES FOR EACH ALTERNATIVE**

ENVIRONMENTAL FACTORS	ALTERNATIVES				
	1- NO ACTION	2- PREFERRED	3- NO LEASE	4- STANDARD LEASE TERMS	5- NO LEASE ROADLESS AND SPNM
<b>Biological Diversity</b>	Same as Alternative 4.	No increased impacts to biological diversity on NSO designated areas.* Temporary loss of biological diversity may result on sites cleared for roads, well pads and pipelines. Some loss of biological diversity of wildlife species, especially in areas opened for logging following O&G activities.	Effects only on existing leases.	Temporary loss in biological diversity resulting from roads, well pad and pipeline construction. Loss of biological diversity of wildlife species, especially in areas opened for logging following O&G activity.	No increased impacts to biological diversity in Roadless and SPNM areas. Impacts on remaining areas same as Alternative 2.
<b>Vegetation</b>	Same as Alternative 4.	Same as Alternative 4.	Effects only on existing leases.	Vegetation removal for pads, roads, pipelines would remove sites from wood fiber and/or forage production. Abandoned drill sites and road locations may be restored to full vegetation over long-term. May result in slightly increased ASQ.	Same as Alternative 4.
<b>Soils</b>	Same as Alternative 4.	NSO recommended for sensitive soils in riparian and alpine/tundra environments would prevent irretrievable/irreversible impacts in these areas. Potential for displacement, compaction and mixing on construction locations in remainder of analysis area.	Effects only on existing leases.	Construction activities result in displacement, compaction and mixing of soil material. Increased potential for erosion and slope failures. Impacts vary with slope and soil type. Forest Plan guidelines provide mitigation through road design and revegetation requirements.	No effect from O&G activity in Roadless and SPNM areas. Same impacts as Alternative 2 in remainder of analysis area.
<b>Air Quality</b>	Minimal impact to air quality. Some dust from road use.	Minimal impact to air quality. Some dust from road use.	Effects only on existing leases.	Minimal impact to air quality. Some dust from road use.	Minimal impact to air quality. Some dust from road use.
<b>Water Quality</b>	Some increase in sediment. Overall impact low. Some risk of spills at drill sites and stream crossings.	Some increase in sediment, but most sensitive areas protected. Accidental spills could occur. Overall impact low.	Effects only on existing leases.	Some increase in sediment. No special protection of sensitive areas. Overall impact moderate. Risk of spill similar to other alternatives.	Some increase in sediment. Impacts confined to areas of existing development. Overall, impacts very low.

**TABLE S-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES FOR EACH ALTERNATIVE**

ENVIRONMENTAL FACTORS	ALTERNATIVES				
	1. NO ACTION	2. PREFERRED	3. NO LEASE	4. STANDARD LEASE TERMS	5. NO LEASE ROADLESS AND SPNM
<b>Range and Livestock Grazing</b>	Same as Alternative 4.	Same as Alternative 4.	Effects only on existing leases.	Surface disturbance would remove forage. Increased access and activity may result in temporary reduction of permitted livestock or change in management system in areas of activity. Potential for introduction of noxious and undesirable plants along roads, well pads and pipelines. Increased access could aid in range management activities.	No effect from O&G activity in Roadless and SPNM areas. Impacts same as Alternative 4 for remainder of analysis area.
<b>Roads</b>	Same as Alternative 4.	No impacts in No Lease and NSO stipulated areas. Impacts same as Alternative 4 in remainder of analysis area.	Effects only on existing leases.	Potential for new road construction in entire analysis area. Road reconstruction would generally increase standard of existing road. Road use would increase during exploration and development stages.	No impacts in Roadless, SPNM and other No Lease and NSO areas identified in Alternative 2. Impacts same as Alternative 4 on remainder of analysis area.
<b>Visual Resources</b>	Alternative 4 impacts lessened through use of vegetative and topographic screening, facility placement, design and color to meet VQO in Retention and Low VAC areas.	Impacts lessened from No Action by retaining VQO in Scenic Byway Corridors in addition to Retention VQO and Low VAC areas.	Effects only on existing leases.	Potential impacts to visual resources greatest during exploratory drilling, less during development and production. Negative impacts to Retention VQO with and without Low VAC (19% of analysis area).	No effect from O&G activity in Roadless and SPNM areas. Impacts same as Alternative 2 in remainder of analysis area.

**TABLE S-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES FOR EACH ALTERNATIVE**

ENVIRONMENTAL FACTORS	ALTERNATIVES				
	1. NO ACTION	2. PREFERRED	3. NO LEASE	4. STANDARD LEASE TERMS	5. NO LEASE ROADLESS AND SPNM
<b>Recreation Opportunities</b>	Recreation opportunities in developed facilities and SPNM areas would be protected. Potential for ROS class to be changed to more developed class in dispersed recreation and Roadless areas. Potential decrease in backcountry recreation opportunities.	Recreation opportunities would be protected in identified developed, dispersed and major trail recreation complexes and in several Roadless Areas. Potential for ROS class to be changed to more developed class in dispersed recreation and Roadless areas. Potential decrease in backcountry recreation opportunities.	Effects only on existing leases.	Improved road standards and increased traffic will alter ROS class to more developed conditions and potentially decrease recreation experience of Forest visitors. Opportunity for backcountry recreation will be reduced.	No effect from O&G activities in Roadless, SPNM and recreation complexes. Impacts same as Alternative 2 in remainder of analysis area.
<b>Cultural and Historical Resources</b>	Same as Alternative 4.	Same as Alternative 4.	Effects only on existing leases.	Cultural survey is required prior to any ground disturbing activity. Any identified cultural resources must be protected by avoidance, or recorded and excavated.	No effect from O&G activity in Roadless and SPNM areas. Impacts in remainder of analysis area same as Alternative 4.
<b>Aquatic/Riparian/Wetland Habitats</b>	Same as Alternative 4.	Same as Alternative 4.	Effects only on existing leases.	Potential impacts from road construction, culvert location and stream crossings resulting in vegetation removal and increased sediment loads, which would decrease spawning habitat, result in macroinvertebrate and fish fry mortality. Increased potential for toxic spills entering waterways.	No effect from O&G activity within Roadless and SPNM areas. Impacts in remainder of analysis area same as Alternative 4.

**TABLE S-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES FOR EACH ALTERNATIVE**

ENVIRONMENTAL FACTORS	ALTERNATIVES				
	1. NO ACTION	2. PREFERRED	3. NO LEASE	4. STANDARD LEASE TERMS	5. NO LEASE ROADLESS AND SPNM
<b>Wildlife</b>	Same as Alternative 4.	Impacts to wildlife and habitat mitigated through NSO, CSU and TL in special habitats. Potential for habitat loss, disturbance and displacement to less desirable habitats on areas with SLT. Impacts compounded in areas opened for logging after O&G activity.	Effects only on existing leases.	Forest Plan provides limited protection: -Timing restrictions for bighorn sheep lambing areas; -Timing restriction for raptor nesting; -Road use restrictions to maintain habitat effectiveness in MIS habitat (4B); -Road construction/use restrictions in big game winter range (5A & 5B). Remainder of area open to Standard Lease Terms, which would result in habitat loss, disturbance, displacement to less desirable habitats, potential increase in conflicts on private land. Impacts compounded in areas opened for logging after O&G activity.	No direct impacts to wildlife in Roadless and SPNM areas. Impacts same as Alternative 2 on remainder of analysis area.
<b>Wildfire</b>	Potential for human caused wildfire would be similar for all alternatives, except for Alternative 3, which would have a slightly smaller potential for wildfire, due to less oil and gas activities. Improved access and increased human activity has the potential to result in increasing human caused wildfires. Increased access could allow more efficient suppression of wildfires, however; both man-caused or naturally occurring.				
<b>Economic and Social Setting</b>	Average of 10 more jobs (above No Lease figure) for 3 months; additional \$4,000 State revenue; additional \$8,000 County revenue from drilling on new leases.	Average of 10 more jobs (above No Lease figure) for 3 months; additional \$4,000 State revenue; additional \$8,000 County revenue from drilling on new leases.	Average of 10 full time drilling jobs; \$32,000 State revenue; \$64,000 County revenue from drilling on existing leases, annually.	Average of 10 more jobs (above No Lease figure) for 3 months; additional \$4,000 State revenue; additional \$8,000 County revenue from drilling on new leases.	Average of 10 more jobs (above No Lease figure) for 3 months; additional \$4,000 State revenue; additional \$8,000 County revenue from drilling on new leases.
<b>Reasonably Foreseeable Development Scenario</b>	The projected activity would occur, but typically in areas least restrictive to industry.		The 7 projected wells outside existing leases and units would not be drilled.	No effect on the RFD.	The projected activity would shift to areas available for oil and gas leasing.

**TABLE S-4. SUMMARY OF ENVIRONMENTAL CONSEQUENCES FOR EACH ALTERNATIVE**

ENVIRONMENTAL FACTORS	ALTERNATIVES				
	1. NO ACTION	2. PREFERRED	3. NO LEASE	4. STANDARD LEASE TERMS	5. NO LEASE ROADLESS AND SPNM
<b>Oil and Gas Resources - Availability</b>	All legally available lands within the analysis area would be available for leasing; however, stipulations modify the Standard Lease Terms in some Affected Environments.  951,450 ac. available.	Oil and gas resources would be available for leasing except in selected Roadless Areas and Research Natural Areas. Special stipulations modify Standard Lease Terms.  813,180 ac. available.	Oil and gas resources within the analysis area would not be available for leasing.  0 ac. available.	All legally available lands within the analysis area would be available for leasing. No special stipulations would be applied.  951,450 ac. available.	Oil and gas resources within Roadless Areas and areas of SPNM would not be available for leasing. Otherwise this alternative is similar to Alternative 2.  552,300 ac. available.
<b>Oil and Gas Resources - Effect on Industry</b>	Costs for the recovery of oil and gas resources would be higher than that of Alternative 4, but lower than Alternatives 2 & 5.	Generally, the costs related to the recovery of oil and gas resources would be higher than that of Alternative 4.	No opportunity to recover oil and gas resources (except on existing leases).	Least cost alternative for the recovery of oil and gas resources. May result in more interest in leasing.	Same as Alternative 2, but fewer lands available for leasing.

\* No effect unless stipulation is waived, excepted or modified.

### Effects of Alternatives on Consumers, Civil Rights, Minority Groups and Women

None of the alternatives would affect civil rights, minority groups or women.

Any alternative could affect consumers if oil and gas prices are kept lower or higher due to increased or decreased supplies of these items. Alternative 3 would remove all NFS lands from future leasing. The resultant loss of revenues could affect consumers during the 15 year planning period.

### Effects of Alternatives on Prime Farmland, Rangeland and Forest Land

"Prime" rangeland and "prime" forest land does not apply to lands in the analysis area. None of the alternatives would affect prime farmland. Under all alternatives, National Forest System lands would be managed with a sensitivity to the effects on adjacent lands.

## **Effects of Alternatives on Wetlands and Floodplains**

The 36 CFR 228 regulations preclude surface occupancy of riparian areas. The management of wetlands and floodplains are subject to Executive Orders 11990 and 11988, respectively. The purpose of the executive orders are to avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and floodplains. Development of oil and gas wells in riparian areas could cause significant effects to the water quality and aquatic habitat.

## **The Preferred Alternative**

The preferred alternative is Alternative 2. This alternative provides resource protection while leaving the majority of the National Forest System lands available for leasing.