United States Department of the Interior
Bureau of Land Management
Bakersfield District
Hollister Resource Area

Final

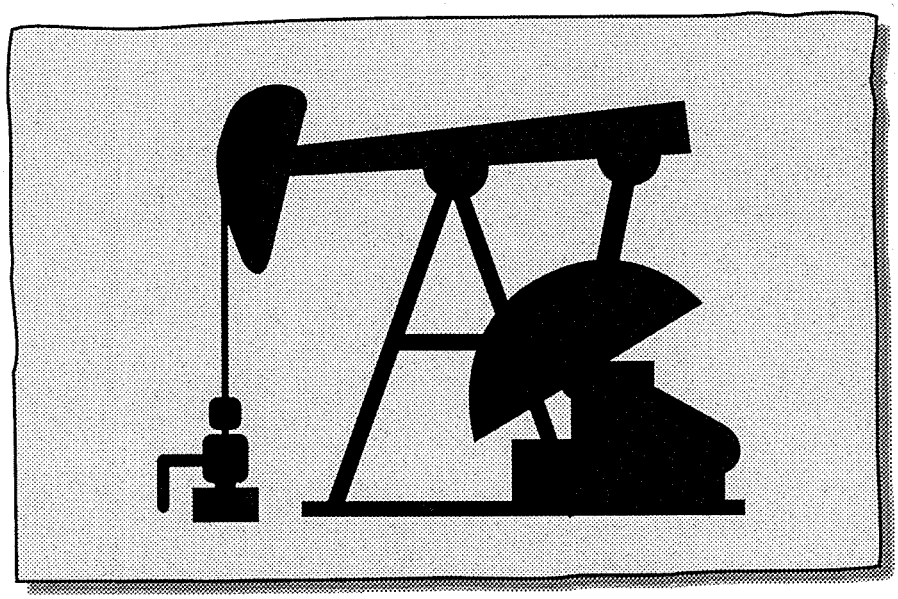
September 1993

Hollister

Oil and Gas RMP Amendment

and

Environmental Impact Statement



BLM Mission Statement

The Bureau of Land Management is responsible for the balanced management of Public Lands and resources and their various values so that they are considered in a combination that will best serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield; a combination of uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources. These resources include recreation, range, timber, minerals, watershed, fish and wildlife, wilderness, and natural, scenic, scientific and cultural values.

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
CALIFORNIA STATE OFFICE
2800 Cottage Way
Sacramento, California 95825

Dear Reader:

Enclosed for your review is the Bureau of Land Management's Proposed Resource Management Plan Amendment and Final Environmental Impact Statement for oil & gas leasing in the Hollister Resource Area. The document outlines five alternatives for managing oil & gas leasing on public lands in the resource area. These alternatives address management issues identified during public meetings and agency scoping conducted early in the planning process. The selected alternative will guide oil & gas leasing on approximately 310,000 acres of public lands and 385,000 additional acres of private lands with federal ownership of subsurface minerals. Alternative "D" (Endangered Species Stipulation On T&E Plant Habitat/NSO On Pinnacles Viewshed) is the BLM's Proposed Action.

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Thank you for your concern and interest in the management of our public lands.

Sincerely,

Ed Hastey

Edward L. Hastey
State Director

PROPOSED RESOURCE MANAGEMENT PLAN AMENDMENT

and

FINAL ENVIRONMENTAL IMPACT STATEMENT

for the

HOLLISTER RESOURCE AREA

DRAFT ( ) FINAL (X)

The United States Department of the Interior

Bureau of Land Management

1. **Type of Action:** Administrative (X) Legislative ( )

2. **Abstract:** This final Resource Management Plan and Environmental Impact Statement describes and analyzed alternatives, including a No Action (existing management) alternative, for managing the Oil and Gas Program on public lands within Hollister Resource Area, California.

3. For further information contact:

Robert Beehler
Bureau of Land Management
20 Hamilton Court
Hollister, CA 95024
(408) 637-8183

FINAL

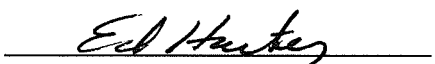
HOLLISTER OIL & GAS RMP AMENDMENT

AND

ENVIRONMENTAL IMPACT STATEMENT

United States Department of the Interior

Bureau of Land Management



State Director
California

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HOLLISTER RESOURCE AREA

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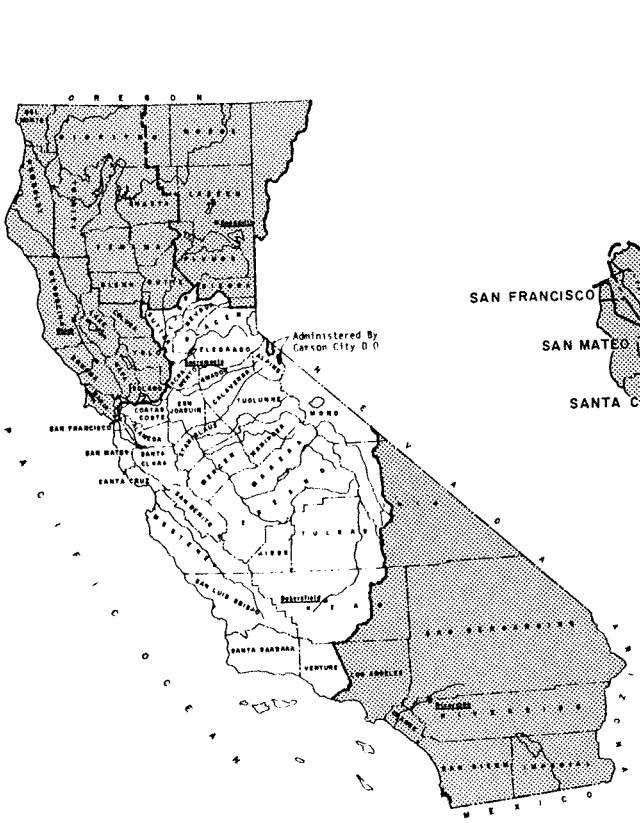

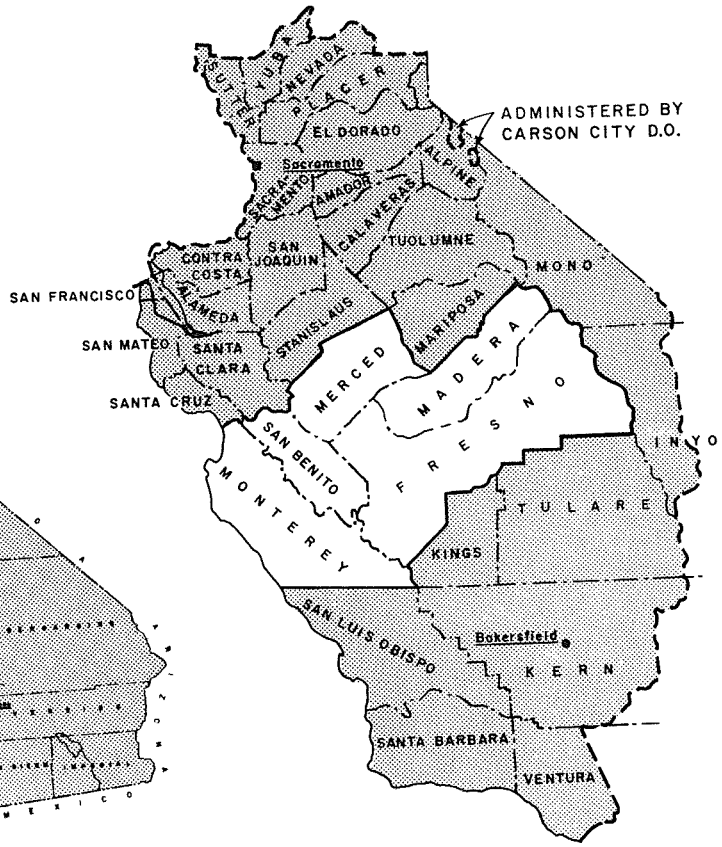

BAKERSFIELD DISTRICT
CALIFORNIA

HOLLISTER RESOURCE AREA
BAKERSFIELD DISTRICT

MAP 1

SUMMARY

This Environmental Impact Statement evaluates alternative plans for oil and gas leasing on federal lands managed by the Bureau of Land Management in the Hollister Resource Area. These lands are in the Central California counties of Monterey, San Benito, Fresno, Madera, and Merced. This document is also a proposed amendment to the Hollister Resource Area management plan (RMP).

Six issues were identified during the public scoping process for consideration in the RMP Plan Amendment. The issues are impacts of oil & gas exploration and development on l) air quality, 2) threatened, endangered and other special status plants, 3) threatened, endangered and other special status animals, 4) visual quality, 5) groundwater or surface water quality, and 6) the impacts of any restrictions on opportunities for mineral exploration and development.

Five alternatives, including a continuation of current management practices, were considered. The alternatives explored options to reduce impacts by not issuing new leases, issuing leases with special stipulations to protect sensitive resource values, and issuing leases with No Surface Occupancy stipulations.

BLM petroleum geologists have developed "Reasonably Foreseeable Development Scenarios" to estimate the amount of oil & gas exploration or development activity that would occur under each alternative. These evaluations indicated that most activity is expected to occur within the existing oil fields. The potential for discovery of a new oil & gas field on federal lands was estimated to be less than five percent.

The analysis of environmental impacts found that opportunities to reduce environmental impacts may be limited since most activity is expected to occur on areas already under lease in the oil fields. Any new restrictions on these operations would have to be consistent with the lease holders rights to explore for and develop any oil & gas deposits within the lease.

The Proposed Action is Alternative "D" (Endangered Species Stipulation on T&E Plant Habitat - NSO on Pinnacles Viewshed). This alternative has been selected because it would allow for continued exploratory drilling and hold open the opportunity for the discovery of new oil & gas resources on public lands, while also providing for all practical and reasonable measures to minimize or eliminate environmental impacts. This alternative would include the following restrictions on oil & gas leasing:

A) 5,500 acres of public land and 17,900 acres of private land with federal mineral ownership would not be available for leasing. These areas are the Squaw Leap

Management Area, the California Coastal Zone, and the Carmel River watershed. These areas have no oil & gas potential.

B) 23,782 acres of public land currently being considered for wilderness would not be available for leasing unless Congress makes a determination they are not suitable for wilderness designation.

C) 3,640 acres of public land and 480 acres of private land with federal mineral ownership within the foreground viewshed of the Pinnacles National Monument would be subject to a No Surface Occupancy stipulation.

D) 83,160 acres of public land and 85,000 acres of private land with federal mineral ownership that is potential or known habitat for three threatened or endangered plant species would be subject to an Endangered Species Stipulation. This stipulation would prohibit any surface disturbing activity or use of vehicles off established roads on the lease until adequate biological inventories had been conducted and analysis had indicated that proposed activities would not jeopardize the continued existence of the T&E species, adversely impact critical T&E species habitat, or be inconsistent with T&E recovery or habitat management plans.

Additional mitigation measures that would be required include limiting new oil & gas development within threatened or endangered (T&E) animal habitat to 10% of the habitat area, requiring air modelling studies prior to any new air emissions in the vicinity of Pinnacles National Monument, and requiring off-site mitigation for any loss of T&E or wildlife habitat. Off-site mitigation could include acquisition and/or improvement of other habitat areas.

Despite these restrictions and mitigation measures, some significant environmental impacts could still result from the oil & gas leasing program. These impacts result primarily from continued operations on producing oil leases in the oil fields of the Coalinga/Avenal area.

Continued development in the Coalinga/Avenal area oil fields could result in the loss of endangered San Joaquin kit fox and blunt-nosed leopard lizard populations. Population numbers are currently low and additional habitat loss and direct mortality could affect the ability of the populations to sustain themselves. Acquisition and transfer to BLM of off-site mitigation lands would be required to compensate for these impacts. Restoration of T&E species habitat would also be the priority objective for reclamation of abandoned oil well facilities.

There is a risk that unknown populations of three T&E listed plants (San Joaquin woolly-threads, California jewelflower, & Hoover's woolly-star) and two plants currently being considered for T&E listing (hollisteria & forked fiddleneck) could be destroyed on existing leases in the Jacalitos and Kettleman North Dome oil fields. Restricting new operations in these oil fields until adequate inventories can be conducted could require deferring any activity for several years if drought conditions prevail. This could conflict with existing lease rights. Since the Draft EIS was published the BLM has conducted additional T&E plant inventories and has increased our

knowledge of habitat requirements. These actions have greatly reduced the potential for unknown populations of these species to be impacted by continuing oil field operations. Exploration and development in chaparral habitats could also destroy habitat for another plant being considered for T&E listing (one-awned spineflower).

There would also be increased emissions of air pollutants contributing to the continued failure of the San Joaquin Air Basin to meet federal air quality standards. Activities on federal leases would be required to be in compliance with all regulatory policies of the San Joaquin Valley Unified Air Pollution Control District which is implementing all feasible control measures to control emissions.

CHAPTER ONE
PURPOSE AND NEED

INTRODUCTION

This Proposed Land Use Plan Amendment and Final Environmental Impact Statement (EIS) evaluates alternative strategies for oil and gas leasing on federal lands managed by the Bureau of Land Management (BLM) in the central California counties of Monterey, San Benito, Fresno, Madera, and Merced (see Map #1). The existing land use plan or Resource Management Plan (RMP) was adopted in 1984. The scope of this plan amendment is limited to a review of decisions related to oil & gas leasing on the public lands.

Lands affected by this EIS and RMP Amendment include about 310,000 acres of public lands and 385,000 additional acres of private lands with federal ownership of subsurface minerals. These lands are managed by the BLM's Hollister Resource Area. This EIS and RMP Amendment will not affect offshore rocks and islands which were closed to oil and gas leasing following completion of the California Rocks and Islands Area of Critical Environmental Concern Plan Amendment in 1990.

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To assist in this assessment of potential environmental impacts, BLM geologists have evaluated the oil & gas potential of the public lands, and have developed "reasonably foreseeable development scenarios". These scenarios project the level of development that is expected to occur on the private and public lands during the next 15 years. The scenarios indicate that less than 0.2% of the federal lands in the Hollister Resource Area would be affected by O&G leasing. Most of these actions would occur within the developed oil fields where federal lands are already under lease. These leases are not expected to be available for renewal during the life of this plan. Map #2 shows the O&G potential of public lands in the Hollister Resource Area and areas that are already under O&G lease.

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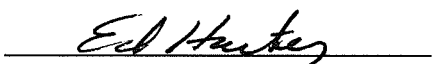

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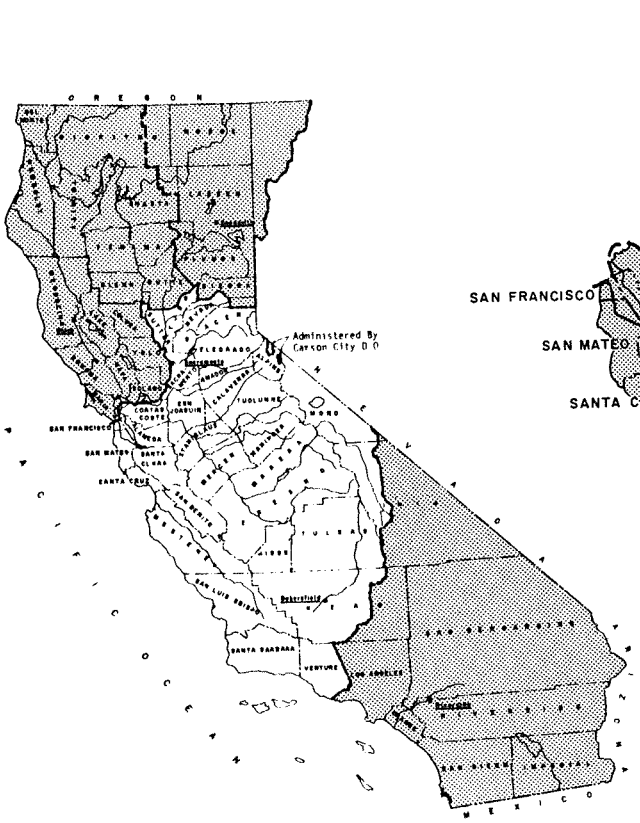

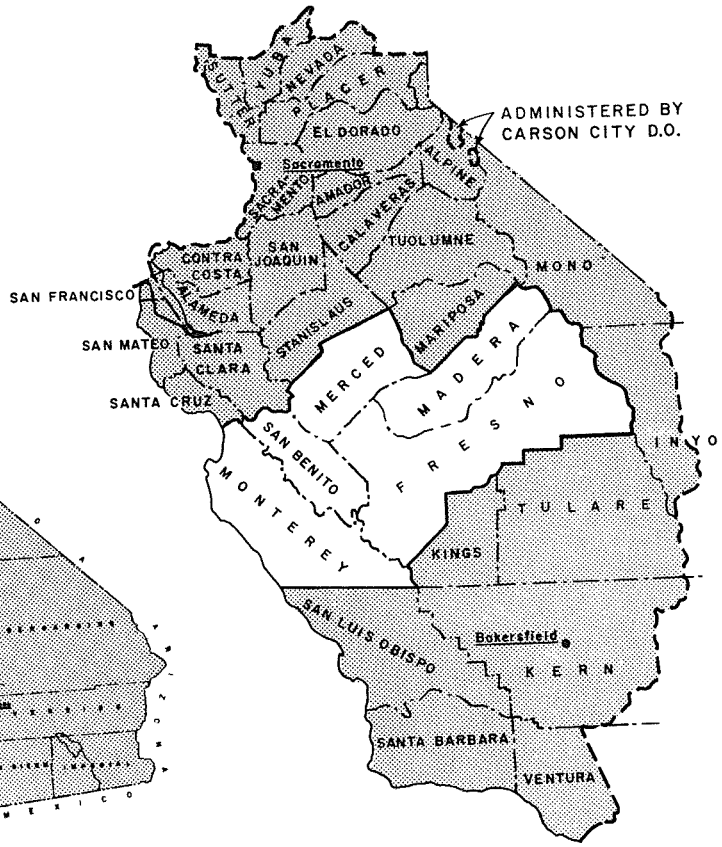

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To assist in this assessment of potential environmental impacts, BLM geologists have evaluated the oil & gas potential of the public lands, and have developed "reasonably foreseeable development scenarios". These scenarios project the level of development that is expected to occur on the private and public lands during the next 15 years. The scenarios indicate that less than 0.2% of the federal lands in the Hollister Resource Area would be affected by O&G leasing. Most of these actions would occur within the developed oil fields where federal lands are already under lease. These leases are not expected to be available for renewal during the life of this plan. Map #2 shows the O&G potential of public lands in the Hollister Resource Area and areas that are already under O&G lease.

The EIS and RMP Amendment considers five alternative strategies for managing O&G leasing on the BLM lands. These strategies or alternatives range from a continuation of the current

leasing practices with no new stipulations or restrictions, to curtailment of the leasing program. The assessment of environmental impacts focuses on the key environmental issues of: 1) air quality, 2) threatened, endangered and other special status plant species, 3) threatened, endangered and other special status animal species, (4) visual quality, (5) groundwater or surface water quality, and (6) opportunities for mineral exploration & development.

PURPOSE AND NEED

Management of public lands in the Hollister Resource Area is guided by the Hollister Resource Management Plan (RMP) which was adopted in 1984 (USDI 1984). A review of recent court decisions (Conner vs Burford) and Supplemental Program Guidance issued by the BLM (BLM Manual 1620) indicate that portions of the plan addressing oil & gas exploration and/or development do not meet current standards. The RMP and supporting environmental documentation did not consider potential development scenarios and cumulative impacts of oil & gas development.

The proposed action is to amend the Hollister Resource Management Plan to more fully address issues related to oil & gas exploration and/or development. Decisions will be made regarding what areas should be available for oil & gas leasing, and what stipulations, if any, should apply to each area.

About 25% of the federal land in the Hollister Resource Area, including all federal land in the developed oil fields, is already under lease for oil & gas exploration and development. New stipulations cannot be applied to these existing leases. Operators are required to obtain specific authorization for new exploration or development activities on leased lands. Existing lease operations could be affected by decisions made in this plan, since elements of new stipulations could be applied as mitigating measures to approvals for new activities on existing leases (Applications for Permits to Drill, etc.). Any new restrictions would, however have to be consistent with the lease rights of the lessees, and could not preclude exploration and development of potential oil & gas resources.

DESCRIPTION OF THE PLANNING AREA

The Hollister Resource Area is located in central California and includes about 310,000 acres of public lands and 385,000 additional acres of private lands with federal ownership of subsurface minerals in the counties of Monterey, San Benito, Fresno, Madera, and Merced.

The Hollister Resource Area is bordered on the west by the Pacific Ocean, Los Padres National Forest and Fort Hunter Liggett Military Reservation, and on the east by the Sierra and Sequoia National Forests. The highly varied major landforms include the Central Coast Range and the Sierra Nevada foothills, as well as the Salinas and San Joaquin Valleys. About two-thirds of the

resource area consists of chaparral and oak woodland vegetation. The remaining third consists of annual grasslands located on the eastern slopes of the Diablo range bordering the San Joaquin Valley and in the southern Salinas Valley. The terrain is typically steep and mountainous. Elevations range from near sea level to over 5,000 feet.

Federal oil and gas production currently occurs in three areas: the tectonically distinct Salinian Block contains the San Ardo oil field in southern Monterey County; across the San Andreas Fault to the east lie fields bordering the Great Central Valley, these include those of western Fresno County (Coalinga, Jacalitos, North Kettleman, and East Coalinga, etc.), and in east-central San Benito County, the Vallecitos field.

Most activities anticipated in conjunction with this plan are expected to occur in or adjacent to the developed oil fields in the vicinity of Coalinga and Avenal. The predominant landscape features of the Coalinga/Avenal area are low, rolling foothills and valley grasslands which border the western edge of the San Joaquin Valley. The area lies within the rain shadow of the Diablo Range to the west and is consequently very arid. Vegetation is characteristic of the valley grassland complex consisting of a variety of annual grasses and herbaceous forbs. Common shrubs include saltbush (*Atriplex spp.*) and in the higher elevations there are scattered California juniper.

THE PLANNING PROCESS

The BLM process to amend a resource management plan follows the same procedure that is used to develop a new plan. These steps and opportunities for public participation are highlighted below:

Step 1. Identification of Issues

This step identifies resource management concerns, environmental concerns, and opportunities that can be addressed in the planning process. The selection of issues provides a focus for the remainder of the plan amendment and EIS process. Public participation in this process, called scoping, has included three workshops and notification of all affected or interested parties. A Notice of Intent to prepare the plan amendment and EIS was published in the Federal Register on January 24, 1990. The following section of this chapter contains a more detailed discussion of the issues selected for this plan amendment and EIS.

Step 2. Development of Planning Criteria

This step identifies the laws, regulations, policy, and management guidance that will govern the consideration of each issue and the selection of alternatives. There is a formal 30-day public review of the planning criteria that is initiated with publication of

a Notice of Availability (NOA) in the Federal Register. The NOA was published in the Federal Register on June 6, 1991. The planning criteria identified for this plan amendment and EIS are described in Appendix A.

Step 3. Collection of Inventory Information

This step collects the data needed to resolve resource management and environmental issues that will be addressed in the plan amendment and EIS. Data for the analysis was obtained primarily from existing sources. Some field inventories were conducted to supplement existing data. Inventories conducted in support of this plan amendment included a botanical inventory of 11,820 acres on federal lands in or adjacent to the developed oil fields near Coalinga and Avenal. Since publication of the Draft EIS, the BLM has completed T&E plant inventories on an additional 18,200 acres that have a high/moderate oil & gas development potential.

Step 4. Analysis of the Management Situation

This step assesses the current situation and provides a baseline for development of the RMP Amendment. This data forms the basis for the "Affected Environment", the description of the "No Action Alternative", and the development of realistic alternative actions.

Step 5. Formulation of Alternatives

This step prepares several complete, reasonable resource management alternatives. The Current Management Alternative describes present management while other alternatives range from additional development to management strategies to reduce environmental impacts or address resource management issues. The Current Management Alternative and four alternative actions are analyzed in this EIS/Plan Amendment.

Step 6. Estimation of Effects

This step analyzes the physical, biological, economic, and social impacts of implementing each alternative. The analysis focuses on the environmental issues identified during Step 1 of this process.

Step 7. Selection of the Preferred Alternative

This step compares the impacts of each alternative and selects the preferred alternative. The selection and analysis of alternatives is documented in the draft RMP Amendment/EIS which is circulated for public review.

Step 8. Selection of the Plan Amendment

This step analyzes public comments, modifies the alternatives as appropriate, and selects the alternative to be adopted as part of the Resource Management Plan (RMP). The proposed Plan Amendment and final EIS is distributed to the public in the final RMP Amendment/EIS document. A 30-day protest period and a 60-day review by the Governor is allowed before the RMP is adopted. A Record of Decision and approved RMP is published after a consideration of any protests.

Step 9. Monitoring and Evaluation

This step involves monitoring and evaluating the resource conditions as the approved RMP is implemented. If monitoring shows that resource issues are not being satisfactorily resolved or that the desired results outlined in the adopted plan are not being met, the RMP may be amended or totally revised.

THE BLM OIL AND GAS LEASING PROGRAM

The BLM administers the public lands in accordance with the Federal Land Policy and Management Act of 1976 and other laws. The leasing of oil & gas resources is governed by the 1920 Mineral Leasing Act. This law applies to all federally owned minerals. In some cases the surface of the land may be owned by a private individual while the minerals still belong to the federal government. In the Hollister Resource Area there are about 310,000 acres of public lands and 385,000 additional acres of private land with federal ownership of the subsurface minerals. The Mineral Leasing Act provides that all of these lands are open to oil and gas leasing unless a specific order has been issued to close the area to leasing.

The BLM offers lands for lease to the highest qualified bidder in a competitive sale. The lease term is five years. The maximum size of each lease is 2,560 acres. Each lease is subject to standard terms and conditions, and may also be subject to special stipulations. Special stipulations can include seasonal restrictions or even a prohibition against any use of the surface. This later restriction is called a No Surface Occupancy stipulation, and is often used when development could have unacceptable environmental impacts. Section six of the standard lease terms provides for mitigation of environmental impacts as a condition of the lease.

> **Section 6. Conduct of operations - Lessee shall conduct operations in a manner that minimizes adverse impacts to the land, air, and water, to cultural, biological, visual, and other resources, and to other land uses or users. Lessee shall take reasonable measures deemed necessary by lessor to accomplish the intent of this section. To the extent consistent with lease rights granted, such measures may include, but are not limited to, modification to siting or design of facilities, timing of**

operations, and specification of interim and final reclamation measures. Lessor reserves the right to continue existing uses and to authorize future uses upon or in the leased lands, including the approval of easements or right-of-ways. Such uses shall be conditioned so as to prevent unnecessary or unreasonable interference with rights of lessee.

Prior to disturbing the surface of the leased lands, lessee shall contact lessor to be apprised of procedures to be followed and modifications to reclamation measures that may be necessary. Areas to be disturbed may require inventories or special studies to determine the extent of impacts to other resources. Lessee may be required to complete minor inventories or short term special studies under guidelines provided by lessor. If in the conduct of operations, threatened or endangered species, objects of historic or scientific interest, or substantial unanticipated environmental effects are observed, lessee shall immediately contact lessor. Lessee shall cease any operations that would result in the destruction of such species or objects.

The lessee must post a bond before commencing any surface disturbing activities on a lease. The size of the bond is set by BLM regulations. The size of the bond can be increased if the operator has a poor compliance record. The purpose of the bond is to provide a financial assurance that all appropriate procedures and stipulations will be followed.

Exploratory oil wells have historically been drilled on less than 5% of the leases issued. After obtaining a lease and prior to drilling, a lessee submits an Application for Permit to Drill (APD) indicating the specific location of the drilling site. The BLM conducts an environmental review of the drilling proposal, and may require additional mitigation measures as conditions for approval of the APD. These measures however, cannot be so restrictive as to preclude the exploration and development of potential mineral resources on the lease.

Historically only one of 15 to 20 exploratory wells drilled actually results in the discovery of oil (Milliken 1990c). Unsuccessful wells are abandoned with the surface reclaimed. If oil is discovered and recovery is economical, then the lessee may develop the field for oil production. The lease remains in effect as long as oil or gas is being actively produced from the lease. When it is no longer economically feasible to extract oil or gas, the lessee prepares a plan for abandonment of the lease. This plan is reviewed and modified or approved by the BLM. The well is plugged, all facilities are removed and the site is reclaimed.

Geophysical explorations can also occur on leases, however these geophysical activities can also be conducted on lands that are not under lease. BLM authorization is required for geophysical explorations. An environmental evaluation is completed before the authorization is issued to

determine appropriate stipulations to protect public resource values. Bonds are also required before geophysical explorations are authorized.

A more detailed description of surface disturbance resulting from oil & gas operations on public lands in contained in Appendix B.

ISSUES

The BLM planning process is issue driven. The development of management proposals is based on the issues identified through public input, resource monitoring, and regulatory or policy mandate.

Six issues were identified during the public scoping process for consideration in this RMP Plan Amendment. The issues are impacts of oil & gas exploration and development on 1) air quality, 2) threatened, endangered or other special status plants, 3) threatened, endangered or other special status animals including raptors, 4) visual quality, 5) groundwater or surface water quality, and 6) the impacts of any restrictions on opportunities for mineral exploration and development.

Issue #1 - Air Quality

Oil and gas exploration/development generates several pollutants which can have a negative impact on air quality. O&G activities on federal land have been projected to be concentrated within the existing oil fields in Monterey, Fresno, and San Benito counties. All of these counties currently exceed federal standards set by EPA for various air pollutants. Violations of these standards are important because they indicate levels of pollution that have an adverse impact on human health and public welfare.

Recent testing has also indicated that federal standards for ozone are being exceeded at Pinnacles National Monument which has been designated a Class I air quality area by the California Air Resources Board. For Class I areas, the Clean Air Act requires special management to control total suspended particulates and sulfur oxide emissions, and requires the prevention of any reduction in visual range or atmospheric discoloration due to man-made pollution.

Specific decisions that need to be considered include: 1) are existing air quality permit procedures sufficient to assure that O&G activities on federal lands are not contributing to the air quality problems, 2) what technology should be required to reduce emissions, 3) are stipulations needed for leases upwind from Class I areas, and 4) should surface occupancy or leasing be prohibited in some areas to avoid air pollutant emissions.

Issue #2 - Threatened, Endangered and Other Special Status Plants

There are four threatened or endangered plant species and 97 other plant species with special status known to occur in the Hollister Resource Area. The threatened San Benito Evening Primrose (*Camissonia benitensis*) occurs only in the Clear Creek Management Area where no oil & gas exploration and development activities are expected to occur. The potential habitat for three newly listed species, however, includes many of the currently developed oil & gas fields where most of the future projected O&G activity is expected to occur. These three species are the endangered California jewelflower (*Caulanthus californicus*) and San Joaquin woolly-threads (*Lembertia congdonii*), and the threatened Hoover's woolly-star (*Eriastrum hooveri*). These areas also contain habitat for two special status plant species, the hollisteria (*Hollisteria lanata*) and the green fiddleneck (*Amsinckia furcata*).

The California jewelflower, San Joaquin woolly-threads, and Hoover's woolly-star and the two special status species are annual herbs whose localities can only be identified during the limited spring growing season. Limited botanical inventories to identify locations of these species on federal lands in the vicinity of the existing oil fields were conducted during the spring of 1991.

The Endangered Species Act of 1973 (as amended) requires the BLM to insure that its actions do not jeopardize the continued existence of listed threatened or endangered species.

Specific decisions that need to be considered include: 1) should surface occupancy be allowed on parcels known to contain special status plant species, 2) what level of inventory should be required on potential habitat prior to leasing and/or development, 3) are stipulations needed or can these species be protected by existing authorities to move most surface disturbing activity up to 200 meters from the initial proposed site, and 4) are stipulations needed to assure that surface disturbance activity does not take place until spring inventories of proposed sites can be completed.

Issue #3 - Threatened, Endangered, and Other Special Status Animals

There are five endangered animal species that occur on public lands in the Hollister Resource Area. The habitat for three of these species includes many of the currently developed oil & gas fields where most of the future projected O&G activity is expected to occur. These three species are the endangered blunt nosed leopard lizard (*Gambelia silus*), giant kangaroo rat (*Dipodomys ingens*), and the San Joaquin kit fox (*Vulpes macrotis mutica*). In addition to these endangered species, this habitat also may support populations of the rare San Joaquin antelope squirrel (*Ammospermophilus nelsoni*), short-

nosed kangaroo rat (*Dipodomys nitrotoides brevinasus*), San Joaquin pocket mouse (*Perognathus i. inornatus*), and five rare beetles.

Most of the habitat occupied by these species is included in the Panoche /Coalinga RTE Area of Critical Environmental Concern (ACEC) (USDI 1987). The management plan for this ACEC includes numerous measures to mitigate impacts to these species resulting from oil & gas exploration and development. These measures are described in Appendix C.

Specific decisions that need to be considered include: 1) should O&G exploration and development activities be allowed in habitat for these T&E animals, 2) are measures outlined in the ACEC plan sufficient or necessary to preclude adverse impacts to species of concern, 3) what additional measures may be appropriate, 4) do these measures need to be incorporated into leases as a stipulation, 5) are stipulations needed to protect peregrine falcon or other raptor species, and 6) are stipulations needed to preserve sites historically occupied by the California condor.

Issue #4 - Visual Quality

Oil & gas exploration and development can result in adverse impacts to the visual quality of areas with scenic values. During the development of the Hollister Resource Management Plan several areas were identified for special management of the visual landscape. These areas were designated Visual Resource Management (VRM) Class II or Class III.

The only areas designated for Class II visual management, where the objective is to maintain the existing character of the landscape, are the public lands adjacent to the Pinnacles National Monument that are in a common watershed with monument lands. These areas have a moderate or no O&G potential with little likelihood of any O&G exploration or development activity.

Among the areas identified as Class III, where the management objective is to allow moderate activities that do not dominate the view of the casual observer, are the expansive grass covered Panoche and Tumey hills that are visible from I-5. These areas have a moderate O&G potential, and some O&G exploration activity can be expected to occur here.

Specific decisions that need to be considered include: 1) is topographic and vegetative screening sufficient to adequately obscure anticipated developments to assure compliance with VRM management objectives, 2) are existing VRM classifications appropriate, 3) should surface occupancy or leasing be prohibited within the foreground viewshed of Pinnacles National Monument, 4) should visual stipulations be attached to leases adjacent to the Pinnacles National Monument, and 5) are stipulations needed to preserve vistas of natural landscapes from the I-5 corridor.

Issue #5 - Groundwater or Surface Water Quality

Wells drilled with inadequate casings or improperly sealed following abandonment can result in contamination of groundwater. Increased sedimentation and oil spills can result in contamination of surface waters and/or groundwater. Construction of petroleum sumps in floodplains could result in contamination of surface waters during flood events.

While the potential for oil spills is generally considered small, there is still public concern over the potential impact of spills on water resources. In 1989 an oil spill from a storage tank on a federal lease in the Vallecitos field resulted in temporary contamination of the Silver Creek drainage.

The BLM currently has standard operating procedures that are designed to protect groundwater resources during oil & gas exploration activities. These standard operating procedures cover well casing requirements, subsurface disposal of wastes, construction and use of sumps, spill contingency plans, and abandonment procedures.

Specific decisions that need to be considered include: 1) are existing standard operating procedures sufficient to preclude contamination of groundwater resources, 2) are additional stipulations/procedures needed to reduce the potential for oil spills in the proximity of surface water resources, and 3) are additional stipulations needed to prevent surface water contamination during flood events.

Issue #6 - Mineral Exploration and Development

Mineral exploration and development provides an important source of revenue to the Federal and State government through rental and royalty income, and provides employment opportunities.

California is currently the fourth largest oil producing state in the United States. Most of California's oil is produced in the southern San Joaquin Valley. California, however, only produces about half of the state's petroleum needs. The remaining oil is imported by pipeline or tanker. Partially in response to declining domestic oil production, there are continuing pressures for increased off-shore oil production.

Specific concerns that need to be considered are: 1) how will restrictions placed on oil & gas exploration and development activities on public lands affect domestic oil production, 2) will these restrictions create a demand for additional oil pipeline construction, tanker traffic, or off-shore oil production, and 3) what impact will these decisions have on government revenues and local employment opportunities.

CHAPTER TWO
DESCRIPTION OF THE ALTERNATIVES

INTRODUCTION

The alternatives have been selected to provide a range of management options to resolve conflicts associated with the identified issues including an increase or decrease in the amount of acreage available for oil & gas leasing. The specific alternatives have been developed to consider avoidance of leasing or surface occupancy in areas with sensitive environmental concerns. Under all alternatives, all areas available to leasing would be subject to all practical and feasible mitigation measures needed to minimize environmental impacts.

MANAGEMENT GUIDANCE THAT APPLIES TO ALL ALTERNATIVES

The following stipulations and conditions would apply to new leases issued in the resource area under all alternatives. These conditions would also be applied to new operations on existing leases as conditions of approval for Applications for Permit to Drill (APD) or geophysical exploration permits.

Measures to Protect Threatened, Endangered, and Other Special Status Species

A) BLM Standard Lease Stipulations (BLM Form 3100-11).

These provisions require the operator to minimize impacts to biological resources, take reasonable measures required by the BLM to protect resources, conduct minor inventories or short term special studies, contact the BLM if threatened or endangered species are observed, and cease operations that would result in the destruction of threatened or endangered species. Reasonable measures are defined in 43 Code of Federal Regulations 3101.1-2 as consistent with lease rights if, at a minimum, they do not require relocation of operations more than 200 meters, require siting of facilities off the lease, or prohibit surface disturbing operations more than 60 days in any lease year.

B) Prior to authorization of any surface disturbing activity a review of existing ecological data would be conducted to determine if any threatened, endangered or other special status species may exist on the proposed site. If this review

indicates species of concern may occur on the site, then a site-specific field examination would be conducted during the appropriate season to determine if the species occupies the site. Field surveys would be conducted by qualified botanists following standards established by the California Department of Fish and Game (1984) and the California Native Plant Society (Nelson 1987). If species occur, then all surface disturbing activity would be moved up to 200 meters and/or prohibited for up to 60 days in any lease year to avoid adverse impacts to the species. If movement of the site this distance or these seasonal restrictions were insufficient to avoid impacts, then additional mitigation measures would be developed in conjunction with consultations with the U.S. Fish & Wildlife Service per Section 7 of the Endangered Species Act. Similar procedures would also be used to avoid adverse impacts to state-listed species, with appropriate measures developed in concert with California Department of Fish & Game regional managers.

C) Specialized habitats such as riparian areas, vernal pools, other wetlands, floodplains, native perennial grasses, saltbush, and oak woodlands would be avoided by surface disturbing activities when practical and feasible alternatives exist.

D) Measures included in the Panoche/Coalinga Area of Critical Environmental Concern (ACEC) Plan (USDI 1987) to mitigate oil and gas exploration and development activities would be implemented in all areas within the resource area where potential or occupied habitat for these species occurs. These measures would also be applied to T&E plant habitat as appropriate. A copy of these measures is in Appendix C.

E) A stipulation prohibiting surface occupancy within 1/2 mile of raptor nest sites during nesting and fledgling seasons would be placed on all leases that include known raptor nest sites. The seasonal prohibition could be waived if field examination indicated the nest site was not being used.

Measures to Protect Scenic Quality (Visual Resources)

A) BLM Standard Lease Stipulations (BLM Form 3100-11).

The operator is required to take reasonable measures to minimize impacts to visual resources. Reasonable measures are defined in 43 Code of Federal Regulations 3101.1-2 to include, but are not limited to, modification of design or siting of facilities, and relocation of proposed operations by up to 200 meters.

Measures to Protect Water Quality

A) BLM Standard Lease Stipulations (BLM Form 3100-11).

The operator is required to take reasonable measures to minimize impacts to land, air and water resources. Such measures include, but are not limited to, specifications of interim and final reclamation measures.

B) Standards and guidelines in the Surface Operating Standards for Oil and Gas Exploration and Development (RMRCC 1989) would be applied to all oil and gas exploration and development activities. These are interagency guidelines developed to provide design and construction techniques and other practices that would minimize surface disturbance, effects on other resources, and maintain reclamation potential of lease sites.

C) Proposed oil and gas development proposals (pad/access road construction, vegetation removal, etc.) on slopes that exceed 10%, within the Clear Creek Area of Critical Environmental Concern (ACEC), or within the selenium-bearing Moreno shale formation would require submission of designs prepared by a licensed professional engineer, incorporating adequate mitigation measures to preclude slope failure or off-site transport of sediments and detailing reclamation procedures that would result in successful restoration and revegetation of the site.

Measures to Protect Cultural Resources

A) BLM Standard Lease Stipulations (BLM Form 3100-11).

The operator is required to minimize impacts to cultural resources, take reasonable measures required by the BLM to protect resources, conduct minor inventories or short term special studies, contact the BLM if objects of historic or scientific interest are observed, and cease operations that would result in destruction of historic objects. Reasonable measures are defined in 43 Code of Federal Regulations 3101.1-2 as consistent with lease rights if, at a minimum, they do not require relocation of operations more than 200 meters or require siting of facilities off the lease.

B) A cultural resource inventory would be required prior to authorization of any surface disturbing activity. Proposed activities would be moved up to 200 meter to avoid adverse impacts to all potentially significant archaeological sites. For sites that could not be avoided, an appropriate data recovery plan would be developed in consultation with the State Historic Preservation Officer and the National Advisory Council on Historic Preservation. Implementation of the data recovery plan would be a condition of approval of the proposed activity.

Measures to Protect Air Quality

A) All oil & gas exploration and development activities that require off-road vehicle use or surface disturbance would be required to obtain an air quality emission permit or verification that such permits are not appropriate from the regional air quality control board.

B) All oil & gas exploration and development activities resulting in surface disturbance or requiring the use of motorized vehicles would be required to suppress fugitive dust emissions from paved and unpaved surfaces in accordance with local APCD regulations.

ALTERNATIVE "A" - CURRENT MANAGEMENT (Map #3)

Acres Open Subject to Standard Terms and Conditions: 652,660

Acres Open Subject to Seasonal or Other Minor Constraints: 18,940
Raptor Nesting Areas = 18,940

Acres Open Subject to No Surface Occupancy & Other Major Constraints: 0

Acres Closed to Leasing: 23,400
Coastal Zone, Squaw Leap, Monterey Peninsula watershed = 23,400

This alternative is a continuation of current management practices subject to the above stipulations and conditions. All areas with potential for discovery of oil & gas would be available for leasing. This would include approximately 280,668 acres of public land and 367,100 acres of private land with federal mineral ownership. Approximately 5,500 acres of public land and 17,900 acres of private land with federal mineral ownership would not be available for leasing. Areas not available for leasing would include the Squaw Leap Management Area (critical watershed values and winter habitat for bald eagles), the California Coastal Zone (high sensitivity viewshed), and the Monterey Peninsula watershed (critical watershed values). BLM studies indicate these areas that would be closed to leasing have no oil & gas potential (Milliken 1990a & 1990c). The only special stipulation would be a seasonal restriction on surface occupancy within 1/2 mile of occupied raptor nests. This would affect leases on up to 11,200 acres of public land and 7,740 acres of private land with federal mineral ownership. Leasing would also not occur on about 23,782 acres that are currently being considered for wilderness designation. Leasing could occur on these lands following a Congressional determination that they are not suitable for wilderness designation.

ALTERNATIVE "B" - NO O&G LEASING

Acres Open Subject to Standard Terms and Conditions: 0

Acres Open Subject to Seasonal or Other Minor Constraints: 0

Acres Open Subject to No Surface Occupancy & Other Major Constraints: 0

Acres Closed to Leasing: 695,000

Under this alternative no new leases would be issued for oil & gas exploration and development on public lands in the resource area. While it is the policy of the Bureau to make public lands available for development of oil & gas leasing where compatible with other resource values and environmental concerns, this alternative is included to provide a baseline for evaluation of the environmental impacts of the federal oil and gas leasing program.

Oil & gas exploration and development activities, however, would continue in areas that are currently leased. Existing leases currently producing oil or gas would remain in effect until production ceased.

ALTERNATIVE "C" - ENDANGERED SPECIES STIPULATION ON T&E PLANT POPULATIONS - NSO ON PINNACLES VIEWSHED (Map #4)

Acres Open Subject to Standard Terms and Conditions: 644,700

Acres Open Subject to Seasonal or Other Minor Constraints: 18,940
Raptor Nesting Areas = 18,940

Acres Open Subject to No Surface Occupancy & Other Major Constraints: 7,960
Pinnacles Viewshed (NSO) = 4,120
T&E Plant Populations (Special Stipulation) = 3,840

Acres Closed to Leasing: 23,400
Coastal Zone, Squaw Leap, Monterey Peninsula watershed = 23,400

Acreage offered for leasing would be the same as in the Current Management Alternative (Alternative "A") except that on approximately 3,640 acres of public land and 480 acres of

private land with federal mineral ownership, leases would be issued with a No Surface Occupancy (NSO) stipulation, and on approximately 3,840 acres leases would be issued subject to a special Endangered Species Stipulation. An NSO stipulation allows land to be leased but does not authorize any surface use on the portion of the lease governed by the NSO stipulation. The following areas would be subject to these additional stipulations:

A) Leases issued on approximately 3,840 acres of public land where populations of the California jewelflower, San Joaquin woolly-threads, or Hoover's woolly-star were found during botanical inventories conducted in 1991 would be issued subject to an Endangered Species Stipulation. This stipulation would prohibit any surface disturbing activity or use of vehicles off established roads on the lease until adequate biological inventories had been conducted and analysis had indicated that proposed activities would not jeopardize the continued existence of the T&E species, adversely impact critical T&E species habitat, or be inconsistent with T&E species recovery or habitat management plans. Most of these parcels are located adjacent to producing oil fields in the Coalinga area where the oil & gas potential is considered high (Milliken 1990a). The stipulation could be waived if it was determined by the Authorized Officer that the conditions warranting the stipulation no longer applied. Examples include if it was determined that the lease did not include T&E habitat or if the protected species was taken off the T&E species list. In all cases, waiver of the stipulation would be considered an issue of major concern to the public and thereby subject to a minimum 30-day public review period.

   Botanical inventories would adhere to the following procedures:

   1) The previously discovered populations would be examined to confirm that the inventory is being conducted during a season and year when the species are detectible. If these known populations are not detectible, then the survey would be deferred until an appropriate season and year when the species are detectible.

   2) Inventories would be conducted by qualified botanists following standards established by the California Department of Fish and Game (1984) and the California Native Plant Society (Nelson 1988). All areas potentially impacted directly or indirectly by the proposed action would be inventoried.

B) Approximately 3,640 acres of public land and 480 acres of private land with federal mineral ownership within the foreground viewshed of Pinnacles National Monument. The areas where this restriction would apply have been determined to have moderate or no oil & gas potential. The stipulation could be waived if a new Environmental Analysis to supersede this EIS was completed and it was determined by the Authorized Officer that the conditions warranting the

stipulation no longer applied. Examples include if trail systems in the monument were closed changing areas that would be frequently viewed by monument visitors or intensive development of adjacent private lands altered scenic quality of the federal lands. In all cases, waiver of the stipulation would be considered an issue of major concern to the public and thereby subject to a minimum 30-day public review period.

C) Seasonal surface occupancy restrictions to protect nesting raptors would also be applied in this alternative.

ALTERNATIVE "D" - ENDANGERED SPECIES STIPULATION ON T&E PLANT HABITAT - NSO ON PINNACLES VIEWSHED (Map #5) (Preferred Alternative)

Acres Open Subject to Standard Terms and Conditions: 476,540

Acres Open Subject to Seasonal or Other Minor Constraints: 18,940
Raptor Nesting Areas = 18,940

Acres Open Subject to No Surface Occupancy & Other Major Constraints: 176,120
Pinnacles Viewshed (NSO) = 4,120
T&E Plant Populations (Special Stipulation) = 3,840
T&E Plant Habitat (Special Stipulation) = 168,160

Acres Closed to Leasing: 23,400
Coastal Zone, Squaw Leap, Monterey Peninsula watershed = 23,400

Acreage offered for leasing would be the same as Alternative "C" - Endangered Species Stipulation on T&E Plant Populations - NSO on Pinnacles Viewshed Alternative. The Endangered Species Stipulation however would apply to an additional 83,160 acres of public land and 85,000 acres of private land with federal mineral ownership. These additional areas that would be subject to the Endangered Species Stipulation are potential habitat for the California jewelflower, San Joaquin woolly-threads, or Hoover's woolly-star that have not been inventoried to determine if the plants are present. Inventory procedures would be the same as described under the previous alternative.

ALTERNATIVE "E" - NO LEASING IN T&E ANIMAL HABITAT (Map #6)

Acres Open Subject to Standard Terms and Conditions: 476,540

Acres Open Subject to Seasonal or Other Minor Constraints: 18,940
Raptor Nesting Areas = 18,940

Acres Open Subject to No Surface Occupancy & Other Major Constraints: 70,020
Pinnacles Viewshed (NSO) = 4,120
T&E Plant Habitat (outside T&E animal habitat) = 65,900

Acres Closed to Leasing: 129,500
Coastal Zone, Squaw Leap, Monterey Peninsula watershed = 23,400
T&E Animal Habitat Outside Oil Fields = 106,100

Habitat for endangered or threatened animal species (San Joaquin kit fox, blunt-nosed leopard lizard, and giant kangaroo rat) would not be leased except within established oil & gas fields. This closure would apply to 64,500 acres of public land and 41,600 acres of private land with federal mineral ownership. Most of the areas that would be closed to leasing are on the east side of the Diablo Range foothills just west of I-5. As in the Current Management Alternative (Alternative "A"), there would also be no leasing in the Squaw Leap Management Area, the California Coastal Zone, or the Monterey Peninsula watershed. The NSO and Endangered Species Stipulation described in the Endangered Species Stipulation on T&E Populations - NSO on Pinnacles Viewshed Alternative (Alternative "D") would also apply to this alternative.

The application of these restrictions would result in 216,168 acres of federal land and 325,500 acres of private land with federal mineral ownership being available for oil & gas leasing. The Endangered Species Stipulation to protect potential and known T&E plant habitat would apply to about 22,500 acres of public land and about 43,400 acres of private land with federal mineral ownership. These are areas containing potential T&E plant habitat that are outside the boundaries of the T&E animal habitat or are within the developed oil fields. The NSO to preserve visual quality in the Pinnacles National Monument viewshed would apply to an additional 3,800 acres of public land and 300 acres of private land with federal mineral ownership.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

Additional alternatives were considered for detailed evaluation. An alternative was considered that would have allowed oil & gas leasing in the Squaw Leap Management Area, the California Coastal Zone, and the Monterey Peninsula watershed. This alternative was not selected for detailed analysis because these areas are all environmentally sensitive and have no oil & gas potential. There has been no industry interest or past leasing activity in these areas. Alternatives that would allow O&G operations to be conducted with fewer restrictions than allowed under current management were also considered. These alternatives were not selected for detailed analysis because the management guidance that applies to all alternatives, which is described at the beginning of this chapter, are all considered practical and feasible requirements to avoid environmental impacts and/or degradation of the public lands. It is the policy of the BLM to apply all reasonable measures to avoid any unnecessary environmental impacts resulting from oil and gas operations on public lands. The Federal Land Policy and Management Act of 1976 requires the BLM to avoid any unnecessary or undue degradation of public lands.

Alternatives with No Surface Occupancy (NSO) restrictions were considered only for relatively small acreage. This is to avoid the use of the NSO stipulation as a de facto "No Leasing" decision.

An alternative to consider not leasing T&E habitat within the developed oil and gas fields was considered but was not included for detailed analysis. These areas are already under lease and are expected to remain under lease for the life of this plan. The impacts of this alternative would be the same as in the No Leasing in T&E Animal Habitat Alternative (Alternative "E").

SELECTION OF THE PROPOSED ACTION

The BLM's Proposed Action is the Endangered Species Stipulation On T&E Plant Habitat -NSO On Pinnacles Viewshed Alternative (Alternative "D") which would be subject to the stipulations and conditions described at the beginning of this chapter, and subject to the additional mitigation measures described below. This alternative has been selected because it would allow for continued exploratory drilling and hold open the opportunity for the discovery of new oil & gas resources on public lands, while also providing for all practical and reasonable measures to minimize or eliminate environmental impacts. All lands with potential for oil & gas development would be identified for leasing, with more than 65% of the resource area identified for leasing subject to standard terms and conditions only. Where stipulations were applied to leases, less restrictive measures were carefully considered in lieu of stipulations. It was determined that less restrictive measures would not provide an appropriate level of protection for environmental resources. Wherever prudent and consistent with appropriate protection of environmental resources, information notices were used in lieu of lease stipulations. Information

notices were used to assure that potential bidders would be aware of special considerations that affect operations on prospective lease lands.

Some areas with sensitive environmental resource values and no potential for discovery of O&G resources were not identified for O&G leasing. It was not considered prudent to expend limited public funding to conduct additional detailed environmental analysis on these areas that geologic conditions render clearly unsuitable for the discovery of O&G resources.

The use of No Surface Occupancy stipulations have been limited to relatively small areas where directional drilling could occur off-site without impacting similar resource values that the NSO is designed to protect. These areas are steep slopes that are readily visible from the Pinnacles National Monument's heavily used trail and road access system. Visual resource mitigation techniques were reviewed and no feasible methods were identified that would preclude degradation of scenic quality on public lands as viewed by the monument's visitors.

An Endangered Species Stipulation has been applied to endangered plant species habitat. The use of this stipulation clearly establishes that when protection of a listed species conflicts with exploration or development of the lease, then protection of the species shall prevail. Less restrictive measures did not provide this assurance. Development of new O&G fields in T&E animal species habitat would be limited to disturbance of 10% of the habitat within the lease area. This level of disturbance is compatible with maintenance of high-quality habitat for these species. We anticipate a continued cooperative effort between the O&G industry, the BLM, the U. S. Fish & Wildlife Service, and California Department of Fish & Game to develop and refine procedures that allow for continuation of O&G activities without jeopardizing the survival of these endangered species.

Requirements that all lease activities on federal lands be permitted by the Regional Air Quality Control Districts would assure that all practical and reasonable measures to resolve air quality degradation are being implemented.

While the imposition of these measures to protect elements of the environment from unnecessary and undue degradation could affect some individual oil and gas operators, it is not expected to have a significant impact on the overall level of domestic oil & gas exploration and development.

This alternative would be implemented in the following manner:

A) 182,688 acres of public land and 273,880 acres of private lands with federal mineral ownership would be available for leasing subject to the standard lease terms. Information Notices would be attached to leases in the following areas to notify lessees that special restrictions may apply to any proposed actions on the leases:

1) All Leases - (air quality mitigation)

2) All Leases - (cultural resources mitigation)

3) T&E Animal Habitat - (RTE ACEC restrictions)

4) T&E Plant Habitat - (T&E Plant restrictions)

5) I-5 Viewshed - (visual resource mitigation)

6) Pinnacles Mgmt Area - (air quality mitigation)

7) Slopes Above 10% - (watershed/erosion mitigation)

8) Clear Creek Mgmt Area - (watershed/erosion mitigation)

9) Moreno Shale Formation - (watershed/erosion mitigation)

10) Floodplains - (floodplains mitigation)

B) About 11,200 acres of public lands and 7,740 acres of private land with federal mineral ownership would be available for leasing subject to a stipulation prohibiting surface occupancy within 1/2 mile of raptor nests during nesting and fledgling seasons. There would be a provision to waiver this stipulation if field examination indicated the nest site was not being used during seasons of normal occupancy.

C) 83,160 acres of public land and 85,000 acres of private land with federal mineral ownership would be available for leasing subject to an Endangered Species Stipulation. These areas have been identified as T&E plant habitat. Surface disturbing activities or use of vehicles off established roads would be prohibited until botanical inventories had been completed and subsequent analysis indicated that proposed activities would not jeopardize the continued existence of the T&E species, adversely impact critical T&E species habitat, or be inconsistent with T&E species recovery or habitat management plans. Botanical inventory procedures would be as described under the Endangered Species Stipulation On T&E Plant Populations - NSO On Pinnacles Viewshed Alternative (Alternative "C"). The stipulation could be waived if it was determined by the Authorized Officer that the conditions warranting the stipulation no longer applied. Waiver of the stipulation would be considered an issue of major concern to the public and thereby subject to a minimum 30-day public review period.

D) 3,800 acres of public lands and 360 acres of private land with federal mineral ownership within the foreground viewshed of Pinnacles National Monument would be available for leasing with a No Surface Occupancy (NSO) stipulation. The stipulation could be waived if a new Environmental Analysis to supersede

this EIS was completed and it was determined by the Authorized Officer that the conditions warranting the stipulation no longer applied. Waiver of the stipulation would be considered an issue of major concern to the public and thereby subject to a minimum 30-day public review period.

E) 5,500 acres of public lands and 17,900 acres of private land would not be available for O&G leasing. These areas are the Squaw Leap Management Area, the California Coastal Zone, and the Monterey Peninsula watershed.

F) 23,782 acres currently under wilderness review would not be available for leasing at this time. Leasing could occur on these lands following a Congressional determination that they are not suitable for wilderness designation. (Note: If the 2,200 acres in the Pinnacles watershed on the monument's north boundary is not designated wilderness, it would be leased subject to the NSO restriction that applies under (D) above.).

Additional Mitigation Measures

A) Air modelling studies per the requirements of the Monterey Bay Unified Air Pollution Control District Rule 207 would be required before any emissions are allowed on leases in the Pinnacles Management Area. If studies indicate Pinnacles National Monument air quality would be degraded, then the use of electric motors or other methods to preclude air quality degradation would be required.

B) Destruction of potential T&E plant habitat would require acquisition and transfer to the BLM of comparable off-site habitat. If suitable lands are not available for purchase, establishment of trust funds for future purchase of mitigation lands could be made in lieu of land purchases.

C) Exploratory drilling in T&E plant or animal habitat would be required to use self-contained units to eliminate the need for sumps and to minimize spillage.

D) Development of new O&G fields in T&E animal habitat would be limited to disturbance of 10% of the habitat area within the lease.

E) Exploratory wells would be moved at least 200 meters from wildlife water sources.

F) Off-site mitigation would be required if development activities in newly discovered fields results in loss of Santa Lucia deer herd habitat.

G) Wherever practical and consistent with other objectives, abandonment procedures would attempt to restore native vegetation and natural appearing contours.

H) Where site-specific evaluation indicates exploratory well sites would be valuable wildlife water sources, conditions would be applied requiring operators to provide the BLM with the option to develop unsuccessful wells for wildlife water. Priority for allocation of new water sources would be to enhance wildlife habitat.

I) Site-specific conditions for well abandonment operations with T&E animal or plant habitat would give priority to maintaining and/or establishing habitat for these species.

J) Within blunt-nosed leopard lizard and San Joaquin antelope ground squirrel habitat, road berms would be avoided during road maintenance and construction with burrows hand excavated to allow animals to escape prior to destruction of the berms.

K) Wherever practical, access roads would be constructed on slopes not visible from the major road corridors.

L) Except within the intensively developed areas of existing oil fields, all new facilities on federal leases would be painted to blend in with the surrounding natural landscape.

M) To prevent contamination of surface waters during flood events, oil sump construction and storage of oil in oil well cellars would not be permitted in floodplains.

Residual Impacts

A) There would be increased emissions of ROGs, nitrogen oxides, and particulates. Emissions generated would be additive to the Air Quality Standards already being exceeded in the San Joaquin Valley Air Quality Basin.

B) There could be a loss of possible populations of the endangered San Joaquin woolly-threads and California jewelflower, the threatened Hoover's woolly-star, and the hollisteria on existing leases in the Jacalitos and Kettleman North Dome oil fields. Exploration and development in chaparral habitats could also result in the loss of possible populations of the one-awned spineflower.

C) There could be loss of some populations of the endangered San Joaquin kit fox and the blunt-nosed leopard lizard as a result of continued development in the Coalinga oil fields.

Monitoring

A) Table #1 summarizes items to be monitored, impact thresholds which will trigger subsequent actions, and actions to be taken if thresholds are exceeded.

B) Specifically the following will comprise BLM's monitoring strategy.

1) Monitoring will be conducted by BLM staff.

2) Results will be conveyed to other concerned agencies when significant adverse impacts have occurred or, absent significant adverse impacts, a report will be submitted to the U. S. Fish and Wildlife Service and the California Department of Fish & Game once every three years prior to October 1st.

3) All known populations of listed plant species will be visited annually and population size, area, vigor, and reproductive success will be measured or sampled following methods established by species experts and researchers.

4) All areas where surface disturbing activities have been authorized will be visited annually to assess if unexpected impacts are occurring.

5) Oil fields under production will be visited twice annually to ensure unauthorized disturbances have not occurred.

C) A moratorium would be placed on leasing within affected areas if the environmental assessment prompted by the monitoring plan indicates that unanticipated significant impacts could result from continuation of the leasing program. The moratorium would remain in effect until a new Environmental Impact Statement was completed.

TABLE #1
MONITORING PLAN
HOLLISTER OIL & GAS PLAN AMENDMENT/EIS

ENVIRONMENTAL ELEMENT	ITEM MONITORED	THRESHOLD	ACTION IF THRESHOLD IS EXCEEDED
AIR QUALITY	# of exploratory wells # of new producing wells # of wells abandoned total new annual emissions	net increase of 20 wells in San Joaquin basin, or net increase of five wells in N. Central Coast basin, or new emissions = 80% of emissions forecast for a basin	complete new environmental analysis & consult with appropriate air quality control board
SPECIAL STATUS PLANTS	annual inventory of known T&E locations in or near existing or future oil activities following CNPS procedures	any damage to occupied habitats or reduction in population size attributable to human disturbance	develop new mitigation measures to preclude additional damage
	# of acres of habitat disturbed	acres impacted exceeds 400 acres	complete new environmental assessment and consult with USF&WS
SPECIAL STATUS ANIMALS	annual monitoring of T&E species in or near existing or future oil activities following ACEC procedures	any damage to burrows, or reduction in population size attributable to human disturbance	develop new mitigation measures to preclude additional damage
	# of acres of habitat disturbed	acres impacted exceeds 400 acres	complete new environmental assessment and consult with USF&WS
VISUAL RESOURCES	visually impacted acres visible from I-5	acres impacted exceeds 120 acres	complete new environmental assessment
WILDLIFE	acres of upland game or Santa Lucia deer habitat disturbed	acres impacted exceeds 40 acres for either deer or upland game	complete new environmental assessment
WATER QUALITY & EROSION	total acres disturbed	acres disturbed (- acres successfully rehabilitated) exceeds 400 acres	complete new environmental assessment
OIL & GAS RESOURCES	price & demand for oil	15% or greater increase in price or demand over two year period	complete new environmental assessment

Note: Thresholds for actions have generally been set at 80% of impacts anticipated in the EIS. This allows for sufficient lag time to allow completion of new environmental assessments before impacts in excess of those anticipated in the EIS occur.

TABLE #2
SUMMARY OF ENVIRONMENTAL IMPACTS

RESOURCES	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Air Quality	Increased emissions of ROGs, NOX, & PM-10 in San Joaquin and North Central Air Basins; failure to meet federal air emission standards in San Joaquin Basin; BLM contribution probably insignificant.	Increased emissions of ROGs, NOX, and PM-10 in San Joaquin Air Basin, reduced emissions in North Central Air Basin; failure to meet federal air emission standards in San Joaquin Basin; BLM contribution probably insignificant.	Impacts would be the same as in Alternative A	Impacts would be the same as in Alternative A.	Impacts would be the same as in Alternative A.
Special Status Plant Species	Possible loss of populations of three T&E species in developed oil fields, and from new exploratory wells in occupied and potential habitat.	Possible loss of populations of three T&E species in developed oil fields.	Possible loss of populations of three T&E species in developed oil fields, and from new exploratory wells in potential habitat.	Impacts would be the same as in Alternative B.	Impacts would be the same as in Alternative B.
Special Status Animal Species	Potential loss of 505 acres of habitat and temporary disturbance of 485 acres of habitat for five T&E species; probable incidental take of some individuals. Could result in loss of populations of San Joaquin kit fox and blunt-nosed leopard lizard.	Potential loss of 450 acres of habitat and temporary disturbance of 335 acres of habitat for five T&E species; probable incidental take of some individuals. Could result in loss of populations of San Joaquin kit fox and blunt-nosed leopard lizard.	Impacts would be the same as in Alternative A.	Impacts would be the same as in Alternative A.	Impacts would be the same as in Alternative B.
Wildlife	Displacement of upland game species from some habitat areas; potential loss of 55 acres of habitat for the Santa Lucia deer herd. Possible development of new water sources for wildlife.	Displacement of upland game species from some habitat areas.	Impacts would be the same as in Alternative A.	Impacts would be the same as in Alternative A.	Impacts would be similar to Alternative A.
Water Quality & Erosion	Increased erosion from long-term disturbance of soils & vegetation on 505 acres and temporary disturbance on 150 acres. Possible oil spill affecting Silver Cr water quality. No impact to groundwater.	Increased erosion from long-term disturbance of soils & vegetation on 450 acres and temporary disturbance on 140 acres. Possible oil spill affecting Silver Cr water quality. No impact to groundwater.	Impacts would be the same as in Alternative A.	Impacts would be the same as in Alternative A.	Impacts would be the same as in Alternative A.

Visual Resources	Potential loss of scenic quality on about 160 acres in viewshed of I-5; potential degradation of scenic quality in viewshed of Pinnacles National Monument.	No impacts to visual quality are anticipated.	Potential loss of visual quality on about 160 acres in the viewshed of I-5.	Impacts would be the same as in Alternative C.	No impacts to visual quality are anticipated.
Oil & Gas Resources	Less than 5% chance for discovery of oil & gas field with up to 1,000,000 barrels of oil. Increase in production is insignificant compared to existing producing fields in region and in California. No significant impact to local or regional economies.	Opportunity for discovery of new O&G field would be foregone. Loss production would be insignificant. Even when cumulative impacts are considered, would have no impact on trend toward increased reliance on foreign imports.	Impacts would be the same as in Alternative A.	Impacts would be the same as in Alternative A.	Impacts would be the same as in Alternative A.

CHAPTER THREE
AFFECTED ENVIRONMENT

INTRODUCTION

The chapter describes those portions of the environment that could be affected by the federal oil & gas leasing program in the Hollister Resource Area. Emphasis has been placed on environmental issues identified during the public scoping process. The Hollister Resource Area includes three designated Areas of Critical Environmental Concern (ACEC). The Clear Creek Serpentine ACEC would not be affected by the oil & gas leasing program because the area has no potential for oil & gas resources. Standard mitigation measures incorporated in the Panoche/Coalinga ACEC Management Plan are also expected to preclude any impact to paleontological resources protected by the Panoche/Coalinga Paleontological ACEC. Potential impacts to special values within the Panoche/Coalinga RTE ACEC are discussed in the threatened, endangered, and special status plant and animal portions of this chapter. Hazardous material concerns are discussed under Water Quality/Groundwater. There are no Wild & Scenic Rivers in the resource area.

With implementation of standard mitigation terms and the management guidance that applies to all alternatives, the following resources are not expected to be affected by the oil & gas leasing program: Native American religious concerns, wetlands, farmlands, recreation, cultural & paleontological resources, and livestock grazing.

AIR QUALITY

For purposes of monitoring and regulating air quality, the state of California has been divided into thirteen air basins. The five counties in the Hollister Resource Area are in portions of two of these air basins. Fresno, Merced and Madera counties are in the San Joaquin Valley Air Basin along with the counties of San Joaquin, Stanislaus, Kings, Tulare, and Kern. San Benito and Monterey counties are in the North Central Coast Air Basin which also includes Santa Cruz County.

Ambient air quality standards have been established by both federal and state legislation for a variety of air pollutants. National "primary" standards represent thresholds which result in known impacts to human health when they are exceeded. National "secondary" air quality standards define levels of air quality judged necessary to protect the public welfare from any known or anticipated adverse affects of a pollutant. For example, degradation of materials such

as rubber, paint and plastics, reduced visibility, soiling effects, and the economic, ecologic and aesthetic damage that can occur to plants.

More stringent standards have also been established for maintaining air quality in designated wilderness areas. Pinnacles National Monument and the Ventana Wilderness have been designated Class I air quality areas by the California Air Resources Board. For Class I areas the Clean Air Act requires special management to control total suspended particulates and sulfur oxide emissions, and prevention of significant deterioration of existing natural and visually aesthetic qualities (MBUAPCD 1989).

In addition to ambient air quality standards, the State of California has begun to implement a long term program to identify, assess and control ambient levels of hazardous air pollutants. This program was initiated by passage of the Air Toxics "Hot Spots" Information and Assessment Act of 1987. As the name implies, "hot spots" are localized point source emissions of air toxics generated by both large and small industrial operations such as mining, oil & gas, manufacturing and processing. This Act is in accordance with Title III of the Clear Air Act as amended in 1990. The regulation specifies National Emission Standards for Hazardous Air Pollutants (NESHAPS) that set limits on emissions of especially harmful air pollutants. Air toxic hot spot violations are monitored and regulated by the local Air Quality Control Districts.

Oil and gas exploration/development generates several pollutants which can have a negative impact on air quality. The principle pollutants emitted by oil and gas activities are 1) carbon monoxide, 2) fine particulate matter (PM-10), 3) reactive organic gases (ROGs), 4) nitrogen oxides, and 6) sulfur oxide (USDA 1983). Emissions of reactive organic gases and nitrogen oxides result in the photochemical production of ozone, one of the principle components of smog.

SAN JOAQUIN VALLEY AIR BASIN

At the present time air quality is managed by the San Joaquin Valley Unified Air Pollution Control District. The San Joaquin Valley Air Basin includes the eight central California counties of San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and Kern. Most of the data in this analysis was developed by the Fresno County Air Pollution Control District. Fresno County data is generally referenced in this discussion of existing conditions in lieu of referencing the basin-wide data. The Fresno County data has been used because it is probably more representative of the central part of the basin where O&G activities being considering in this plan amendment would occur. For example, while it is estimated that about 15% of the ROG emissions in Fresno County are attributable to the O&G industry, estimates for the entire basin attribute over 40% of ROG emissions to the O&G industry (SJVUAPCD 1992).

The San Joaquin Valley Air Basin currently exceeds both federal and California ambient air quality standards for ozone, carbon monoxide, and PM-10. Air quality is a severe problem in

Fresno County with air quality worse than many larger metropolitan areas such as New York or Chicago (CARB 1988).

During 1989 federal ozone standards were exceeded in Fresno County on 24 days while California ambient ozone standards were exceeded on 109 days. Ambient ozone concentrations were as high as 42% above the federal standard. Federal PM-10 standards were exceeded on seven days while the more stringent California standards were exceeded on 39 separate days. Federal and California carbon monoxide standards were exceeded on 17 days (FAQCB 1989).

The petroleum industry has been identified as one of the major sources of ozone generating compounds within Fresno County. Oil & gas production and processing activities are estimated to generate about 15% of the ROGs and about 10% of the nitrogen oxide emitted in the county (CARB 1988). The industry is not considered a significant contributor to carbon monoxide or PM-10 emissions. There are about 4,485 producing oil & gas wells in Fresno County with about 110 or 2.5% on federal leases. Oil operations on federal leases therefore are probably responsible for less than 1% of total emissions or 0.37% of the ROGs and about 0.25% of the nitrogen oxide emissions in the county.

The prognosis for improvement of total air quality in Fresno County and the San Joaquin Air Basin is not good. Despite reductions in the emissions of reactive organic gases, ozone concentrations have been increasing in severity. The Air Resources Board is currently projecting a 7% increase in ROGs and a 4% increase in nitrogen oxides by the year 2000. BLM's contribution to the increase is projected to be negligible. Attainment of federal air quality standards for ozone is not anticipated by 2005 (CARB 1988).

NORTH CENTRAL COAST AIR BASIN

Air quality within the North Central Coast Air Basin is managed by the Monterey Bay Unified Air Pollution Control District. This District includes Monterey, Santa Cruz, and San Benito Counties. The basin currently exceeds federal ambient air quality standards for ozone, and exceeds California ambient air quality standards for ozone and fine particulate matter (PM-10). Violations of the federal ozone standards were recorded on seven separate days in Pinnacles National Monument between 1987 and 1989, and one in Carmel Valley in 1989. There have been no violations of the federal standards recorded in the basin since 1989. Violations of the California ozone standards were recorded on 64 separate days totalling 206 hours between 1987 and 1990 at monitoring stations in Pinnacles National Monument, Hollister, and Carmel Valley. No violations of the federal standards for PM-10 have been recorded, however violations of the more stringent California standard have been recorded in the basin on 21 days between 1986 and 1990 (MBUAPCD 1991).

Oil & gas production & processing activities are estimated to generate about 1% of the ROGs, about 5% of the nitrogen oxides, and about 1% of the fine particulate matter emitted in the

basin. By contrast on-road motorized vehicles currently account for 36% of the ROGs and 50% of the nitrogen oxide emissions in the basin (MBUAPCD 1989).

There are currently approximately 1,454 producing oil wells in the North Central Coast Air Basin. Only 18, or about 1.3% of these wells are located on federal leases. By extrapolation, it is anticipated that oil & gas facilities on federal leases are currently contributing a negligible amount (.015% of the ROGs, .075% of the nitrogen oxide, and .015% of the fine particulate matter) of these pollutants emitted in the basin.

The 1991 Draft Air Quality Management Plan for the Monterey Bay Region anticipates that the region will be able to meet federal ambient air quality standards for ozone by 1997 (MBUAPCD 1991). Since the federal ozone standard has only been exceeded four times in the past three years, the region may already be in compliance with the federal ambient air quality standards for ozone (see comment letter 2.2 in Chapter 5).

VEGETATION

Public lands within the Hollister Resource Area are primarily dominated by four vegetation types; chaparral, annual grassland, half-shrub, and oak woodlands.

Oak woodlands are of particular concern because of the rapid loss of oaks in urban-range environments (USFS 1980) and due to the possibility that existing oak woodlands may be in decline due to poor regeneration (BLM 1990). Oaks are estimated to grow on about 15 to 20 million acres in California (Callaham 1979) and it is estimated that over one million acres have been lost since 1945 due to agricultural conversion and urban encroachment (BLM 1990).

In addition to oak woodlands, a small percentage of public lands within the Hollister Resource Area support other plant communities of concern that could be affected by future oil and gas development. These include saltbush scrub, riparian and wetland vegetation, desert disjunct sand dune communities and stands of native perennial grasses.

Over 90% of saltbush scrub in the San Joaquin Valley region has been eliminated, primarily by conversion to agricultural lands, urban and rural development, and the development of oil and gas fields.

A large percentage of riparian (such as drainages which have broad-leaved vegetation and which have seasonal flows) and wetland habitat (i.e. springs and vernal pools) have also been lost or degraded (such as by the invasion of aggressive introduced plant species) by development pressures and because of intensive livestock grazing.

Desert sand dune communities occur in the Ciervo Hills and along Monocline Ridge in the western foothills of the San Joaquin Valley in Fresno County. These communities, which represent isolated pockets of habitat otherwise found in the Mojave Desert, are currently

threatened by the invasion of aggressive weeds such as tumbleweed (Salsola iberica) and by trespass off-road vehicle use.

Native perennial (long-lived) grasslands are estimated to have originally covered 33% of California and much of the San Joaquin Valley region. The same grasses are currently estimated to cover 1% of California (Lowry 1991). Perennial grasses have been largely replaced by European annual (short-lived) grasslands.

During the 15 year life of this plan there is a projected total of 17,000 acres of vegetation which is expected to be affected by oil and gas development operations (see Table 9). This includes approximately 500 acres of vegetation on public lands and 3,400 acres of vegetation on private lands which will be temporarily disturbed by such activities as exploratory drilling, seismic exploration, and temporary roads to unsuccessful wells. The 17,000 acre projection also includes the long-term disturbance of approximately 500 acres of public lands and 12,600 acres of private lands by the construction of facilities such as long-term roads, well pads, and tank farms.

The majority of the 1,000 acres of public lands projected to be disturbed by oil and gas activities are in the Coalinga and East Coalinga Oil Fields. Annual grassland and saltbush scrub were the likely dominant plant communities when these oil fields were established and these two plant communities would be the most affected by additional surface disturbance in these areas.

Most of the 16,000 acres of private lands in the Hollister Resource Area projected for surface disturbance related to oil and gas development are in the San Joaquin Valley east of Interstate 5. There are no public lands in this area and about 4000 acres of private lands with federal mineral rights. Saltbush scrub and annual grasslands are also the two dominant plant communities on these lands.

Affected threatened, endangered, and other special status plants are discussed under a separate heading below.

THREATENED, ENDANGERED AND OTHER SPECIAL STATUS PLANTS

There are one-hundred and one plant species in the Hollister Resource Area that are either federally listed as endangered or threatened, or are otherwise designated by BLM as having special status (Special status designations are described in the footnote to Appendix D). Nine of these are known to occur on some of the public lands within the Hollister Resource Area which are likely to be subject to future oil and gas development. Their names, status, habitat needs, and areas of concern relative to this EIS are listed in Table 3. Additional information for each of these nine species is also provided below. Three special status plant species have a moderate potential of occurring on public lands in the Hollister Resource Area where

foreseeable oil and gas development may occur. These are listed along with their status and habitat in Table 4. The remaining 89 plant species which have special status and occur in the Hollister Resource Area have a low potential of being affected by foreseeable oil and gas development and are listed in Appendix D.

In 1991, inventories for special status plant species were conducted on most public lands within existing oil fields and in areas with high oil and gas potential in the Hollister Resource Area. A summary of these results is provided below.

Most public lands and many of the private lands in the Coalinga and East Coalinga Oil Fields were inventoried by BLM staff and Fresno State University staff (John Stebbins personal communication, 9/27/91). The forked-fiddleneck (Amsinckia furcata) was the only special status plant species encountered in these fields. Long-term and severe surface disturbance related to oil and gas operations has occurred in these oil fields and this disturbance has resulted in degraded habitat quality and the establishment of introduced, weedy plant species. It is unlikely that continued development in these two oil fields would affect any existing populations of special status plant species other than the forked-fiddleneck. These fields are also considered to have very poor quality site conditions for the reestablishment of local special status plant species.

Inventories conducted on much of the federal and private lands in the Jacalitos and Kettleman North Dome Fields recorded the occurrence of four special status plant species (Lembertia congdonii, Eriastrum hooveri, Hollisteria lanata, and Amsinckia furcata). Both the Jacalitos Hills and the Kettleman Hills, though moderately to heavily disturbed by past and current oil and gas operations, appear to be good candidates for recovery areas for these species since they are already occupied and have a larger component of native habitat than adjacent areas which also contain public lands.

Inventories in the Kreyenhagen Hills resulted in the discovery of a new population area of Caulanthus californicus. The Kreyenhagen Ranch, which contains 40,000 acres of the Kreyenhagen Hills, has not been developed by oil and gas operations and has been moderately impacted by livestock grazing. Nineteen ninety-one was a very productive year on this ranch for native forbs and there appears to be substantial habitat and potential for additional C. californicus populations.

Inventories in the Vallecitos Oil Field and the adjacent valley and uplands recorded the occurrence of three special status plant species (Lepidium jaredii ssp. album, Hollisteria lanata, and Amsinckia furcata). Though there was apparently sufficient rain to support other special status species such as Lembertia congdonii, none were found (Dean Taylor, personal communication 9/27/91). It is possible that habitat in the Vallecitos Valley area is not as suitable for these other species as the nearby Panoche drainage or the foothills closer to Coalinga.

Inventories were not conducted in the San Ardo oil fields. These fields contain 40 acres of BLM-administered lands.

TABLE #3
SPECIAL STATUS PLANT SPECIES THAT OCCUR IN AREAS IMPACTED BY O&G LEASE ACTIVITIES

SPECIES	LEGAL STATUS FEDERAL/STATE	AREAS OF CONCERN	HABITAT
California Jewelflower (Caulanthus californicus)	FE/SE	Coalinga, Vallecitos	sandy soils in valley and foothill grass grasslands
Hoover's Eriastrum (Eriastrum hooveri)	FT/--	Coalinga Vallecitos	sandy soils in valley and foothill grasslands, saltbrush scrub
San Joaquin Wooly-threads (Lembertia congdonii)	FE/--	Coalinga Vallecitos	sandy soils in valley and foothill grasslands, saltbrush scrub
Forked Fiddleneck (Amsinckia furcata)	C2/--	Coalinga Vallecitos	barren, talus or clay slopes in annual grasslands
One-awned Spineflower (Chorizanthe rectispina)	C2/--	San Ardo	open, gravelly chaparral soils
Carmel Valley Bush Mallow (Malacothamnus palmeri var. involucratus)	C2/--	San Ardo	deep, chaparral soils
Hollisteria (Hollisteria lanata)	C2/--	Coalinga Vallecitos	flat, open sandy or gravelly slopes, annual grasslands
South Coast Range Morning Glory (Calystegia collina venusta)	C2/--	Vallecitos	serpentine grassland
Jared's Peppergrass (Lepidium jaredii var. album)	--/--	Coalinga Vallecitos	open, hard clay soils, foothill grasslands

TABLE #4
SPECIAL STATUS PLANT SPECIES THAT COULD OCCUR IN AREAS IMPACTED BY O&G LEASE ACTIVITIES

SPECIES	LEGAL STATUS FEDERAL/STATE	AREAS OF CONCERN	HABITAT
Oval-leaved Snapdragon (Antirrhinum ovatum)	C2/--	Coalinga, Vallecitos San Ardo	open, clay/ gypsum soils
Recurved Larkspur (Delphinium recurvatum)	C2/--	Coalinga	moist, alkaline soils
Slender Pentachaeta (Pentachaeta exilis aeolica)	C2/--	San Ardo, Vallecitos	grassy areas near 2000' elevation

CALIFORNIA JEWELFLOWER - CAULANTHUS CALIFORNICUS

The California jewelflower was listed as Endangered by the California Dept. of Fish and Game in November 1986 and by the U.S. Fish and Wildlife Service in July 1990. Detailed information on the life-history and habitat of this species is reported by Taylor and Davilla, 1986.

The historic range of the California jewelflower was bounded by Coalinga and Fresno to the north, extended southwest through Cuyama Valley in Santa Barbara County, then east through Carrizo Plain in San Luis Obispo County, and on to Bakersfield in Kern County (BLM 1991). This historic range is known to have included approximately 60 populations of the California jewelflower. Today there are approximately 32 known populations remaining. All the San Joaquin Valley floor populations are now extirpated (with the exception of a reintroduced population at The Nature Conservancy's Paine Preserve) and virtually all of the San Joaquin Valley's habitat capable of supporting Caulanthus californicus has also been eliminated.

In addition to the introduced Paine Preserve population, only three areas are known to currently support Caulanthus californicus: 1) private lands in the Cuyama Valley (these populations are known to range from zero to several thousand individuals from year to year (Dean Taylor 1991, personal communication)), 2) BLM-administered lands in the Kreyenhagen Hills of Fresno County (these populations contained approximately 2,000 individuals in 1991 and extended over a 400-acre area(BLM-Hollister files)), and 3) the TNC/BLM administered lands in the Carrizo Plain. These three population areas are considered critical to the recovery of this species however it is quite possible that most of the optimal habitat for the California jewelflower was the valley floor habitat which has been eliminated and that remaining populations are in habitat which is of comparatively marginal quality for this species.

Loss of habitat and grazing (livestock appear to preferentially seek this species (USFWS 1991)) are the most significant threats to Caulanthus californicus. Soil compaction and competition from alien plant species may also adversely affect jewelflower populations(BLM 1991).

The Kreyenhagen Hills is the only one of the three California jewelflower population areas within the Hollister Resource Area. Soil at this location is a sandy, gravelly, loam and the vegetation is annual grassland and juniper(Juniperus californica)-grassland. This area is considered to have a high potential for oil and gas deposits (Milliken 1990a). BLM inventories and site evaluations conducted between 1991 and 1993 would indicate that this species favors sandy loamy soils with a high quartz content.

SAN JOAQUIN WOOLLY-THREADS - LEMBERTIA CONGDONII

The San Joaquin woolly-threads was listed as Endangered by the U.S. Fish and Wildlife Service in July 1990. The California Dept. of Fish and Game has not given Lembertia congdonii any

special status. Detailed information on the life-history and habitat of this species is reported by Taylor, 1989.

The historic range of the San Joaquin woolly-threads included the San Joaquin Valley floor from western Fresno County and eastern Tulare County south to the northern foothills of the Tehachapi Mountains. Its western range extended through the Carrizo Plain and on to Cuyama Valley in Santa Barbara County (BLM 1991). This historic range is known to have included at least 98 populations of the San Joaquin woolly-threads (Taylor 1989, BLM Hollister files). Today there are approximately 66 known populations remaining and nine historical L. congdonii locations where suitable habitat remains.

In the Hollister Resource Area there are ten known populations of the San Joaquin woolly-threads, four of which occur on BLM-administered lands and six of which occur on private lands (BLM-Hollister files). The majority of these populations (7) occur in the Jacalitos Hills and Kettleman Hills which contain 1,480 acres of BLM-administered lands. Both the Jacalitos and Kettleman Hills are considered to have a high potential for oil and gas reserves however they are not likely to have further oil and gas development during the next 15 years (Milliken 1990c). However abandonment and reclamation of existing production sites in these areas is expected to occur (see Impacts section for further discussion on potential impacts to special status plants from abandonment activities).

L. congdonii populations have a strong association with sandy soils and usually occur in annual grasslands or saltbush scrub which has not been recently disturbed. Over 90% of the saltbush scrub habitat in the western San Joaquin Valley and adjacent foothills has been eliminated (Taylor 1991, pers. communication).

Agricultural conversion is believed to be the cause of 90% of the eliminated L. congdonii populations(Taylor 1989). Other activities which severely alter the ground's surface such as construction of oil and gas facilities, or urbanization, are also likely to have eliminated San Joaquin woolly-thread populations. Less severe surface disturbing activities, such as livestock grazing and vehicle use during seismic exploration, could have adverse impacts to populations of this species by compacting the soil or crushing individual plants.

The most important biological threat to the San Joaquin woolly-threads appears to be competition from aggressive, European weeds and grasses that are adapted to livestock grazing and agriculture. Air pollution may also pose a threat to L. congdonii. At least one introduced species (Bromus rubens) has been shown to develop pollution-resistent traits which allows it to better compete with native annuals such as L. congdonii (Taylor 1989).

HOOVER'S WOOLLY-STAR - ERIASTRUM HOOVERI

Hoover's woolly-star was listed as Threatened by the U.S. Fish and Wildlife Service in July 1990. The California Dept. of Fish and Game has not given Eriastrum hooveri any special

status. Detailed information on the life-history and habitat of this species is reported by Taylor and Davilla, 1986.

The historic range of Hoover's woolly-star includes the western half of the San Joaquin Valley, the western foothills of Fresno and Kern Counties and as far west as the western Panoche Hills, San Benito County. The southern portion of this species' range also extends west into the Carrizo Plain and Cuyama Valley of San Luis Obispo and Santa Barbara Counties. This historic range is known to have included at least 120 populations of Hoover's woolly-star (Taylor 1986, BLM Caliente and Hollister Resource Area files). Today there are approximately 110 known populations remaining, 92 of which are in the Caliente Resource Area and 18 of which are in the Hollister Resource Area.

Two of the 18 known populations of Eriastrum hooveri in the Hollister Resource Area are on BLM-administered lands and these are found in sparsely-vegetated, saltbush scrub-grasslands, typical habitat for this species. Both of these populations are proposed for fencing to exclude livestock grazing and as much surface-disturbing activity as is feasible. In the Hollister Resource Area, oil and gas development is a significant threat since one of the resource area's two populations of E. hooveri on BLM-administered lands is in the Jacalitos Hills, an area with high oil and gas potential and currently under an oil lease. BLM inventories and site evaluations conducted between 1991 and 1993 would indicate that this species favors silty or semi-sandy loamy soils, southern aspects, and sites with limited competition from annual grasses.

The effects of grazing on E. hooveri have not been studied but it is possible that hoof disturbance of soil crust may allow for denser growth of competing annuals which may compromise habitat quality for E. hooveri. This is supported by the presence of many E. hooveri populations growing on patches of cryptogamic soil crusts that support lower annual cover than surrounding areas (Taylor and Davilla, 1986).

HOLLISTERIA - HOLLISTERIA LANATA

Hollisteria has been designated a Category 2 species as a candidate for listing as either threatened or endangered by the U.S. Fish and Wildlife Service. Hollisteria has not been given any special status by the California Dept. Fish and Game.

The historic distribution of hollisteria includes the lower elevations of the inner Coast Ranges and the low hills on the east side of the southern San Joaquin Valley. Some of Hollisteria's suitable habitat has been lost due to oil development, agriculture, and possibly overgrazing. Currently populations are known from Kern and Santa Barbara Counties north to Merced and Monterey Counties.

In Fresno County hollisteria is known to grow in Valley Grassland (at times alongside Lembertia congdonii and Eriastrum hooveri) and here its habitat (similar to that of the three listed species discussed above) appears to be pockets of reduced annual grass cover on dry, often barren,

slopes of sandy or gravelly soils. Elsewhere in Fresno County hollisteria is known to occur on sandy ridgetops in the Kreyenhagen Hills and Joaquin Ridge, and on sandy benches above washes along Hwy 33. In San Benito County hollisteria occurs on gravelly substrate around washes and roadsides near Mercey Hot Springs, and in southern Monterey County it is found on gravelly serpentine grasslands around Turkey Flat. Extensive habitat remains for hollisteria in the Hollister Resource Area and future surveys for this species may record many more additional populations.

FORKED-FIDDLENECK - AMSINCKIA FURCATA

The forked-fiddleneck has been designated a Category 2 species as a candidate for listing as either threatened or endangered by the U.S. Fish and Wildlife Service. The forked-fiddleneck has not been given special status by the California Dept. of Fish and Game.

The historic range of the forked-fiddleneck stretches along the inner coast ranges from eastern San Benito County south to southeastern San Luis Obispo County. There are approximately 40 known populations of Amsinckia furcata (Dean Taylor, personal communication 9/24/91), many of which have been discovered since 1982. Approximately 17 populations of the forked-fiddleneck occur on public lands within the Hollister Resource Area.

The habitat of the forked-fiddleneck is usually sparse, almost barren annual grassland on steep slopes and roadcuts where the soil is a white or dark brown shale talus or a very fine clay (Kiguchi, 1986). A few of its known populations grow on other soils such as patches of open sand at the base of large boulders and in clay or gravelly soils of roadsides. The forked-fiddleneck also has demonstrated the ability to colonize washes below areas of its more typical shale talus habitat. Common associates are the perennial barestem buckwheat (Eriogonum nudum var. indictum) and annual buckwheats. Threats to Amsinckia furcata include elimination of populations by surface-grading activities such as construction of oil and gas facilities, severe grazing, and in some cases, off-road vehicle use. Some forked-fiddleneck populations grow on roadcuts and other disturbed sites (such as naturally revegetated cattle trails, and small landslides) which indicates this species is tolerant of or may benefit from some level of disturbance. Because recent vegetation inventories have recorded 'new' populations it is believed that future inventories are likely to find additional populations. This species is probably not as rare or threatened by competing land uses as previously believed.

ONE-AWNED SPINEFLOWER - CHORIZANTHE RECTISPINA

The one-awned spineflower is currently designated a Category 2 species as a candidate for listing as either threatened or endangered by the U.S. Fish and Wildlife Service. The one-awned spineflower has not been given any special status by the Calif. Dept. of Fish and Game.

Chorizanthe rectispina is known to occur in Monterey and San Luis Obispo Counties. There are less than 10 known populations, three of which are atop a ridgeline near Williams Hill in Monterey County, two of these on BLM-administered land.

Not much is known of this species' habitat except that it grows in openings of chaparral on granitic sand or disintegrating shale. C. rectispina is a prostrate growing annual which is easily overlooked in its pre-flowering growth stages. This, in addition to its late blooming season (June-July) and harsh environment (often dry, hot, and tough terrain) make it a difficult plant to locate. It is possible that its rarity is at least partly a function of these circumstances.

In the Hollister Resource Area C. rectispina is considered a potential species to be found near the San Ardo Oil Fields however only 40 acres in these fields are administered by BLM. One possible scenario under Alternative A is that isolated wildcat wells could be drilled on public lands in the hills near San Ardo which contain habitat for C. rectispina habitat. Due to this species prostrate growth habit, direct grazing impacts are probably negligible. Other potential impacts are not known at this time. The one-awned spineflower does occur on some heavily disturbed sites such as helipads and areas cleared of brush for fire prevention.

CARMEL VALLEY BUSHMALLOW - MALACOTHAMNUS PALMERI VAR. INVOLUCRATUS

The Carmel Valley bushmallow is currently designated a Category 2 species as a candidate for listing as either threatened or endangered by the U.S. Fish and Wildlife Service. This species has not been given any special status by the Calif. Dept. of Fish and Game.

The Carmel Valley bushmallow is known to occur in chaparral habitat from Carmel Valley in Monterey Co. south to Cuesta Pass in San Luis Obispo County. It can be common in areas recently burned after fire and very rare during long periods between fires. Several populations occur on BLM-administered lands in the Hollister Resource Area between the town of Jolon and Hwy. 101 in Monterey County. Like the one-awned spineflower discussed above, the largest oil and gas related threat to Carmel Valley bushmallow populations is isolated wildcat oil and gas exploration in the San Ardo area. Herbivores can also directly impact this species since it is eaten by cattle and deer and these animals are attracted to burned areas by the lush forage which grows after fires.

SOUTH COAST RANGE MORNING-GLORY - CALYSTEGIA COLLINA VAR. VENUSTA

The South Coast Range morning-glory is currently designated a Category 2 species as a candidate for listing as either threatened or endangered by the U.S. Fish and Wildlife Service. This species has not been given any special status by the Calif. Dept. of Fish and Game.

The South Coast Range morning-glory is known from a four-county area which includes Santa Barbara, Monterey, San Benito and Fresno Counties. Several populations were recently discovered in 1991 plant surveys. These populations were recorded in the Diablo Range near Vallecitos Valley, Laguna Mountain, and Turkey Flat.

Very little is known about this species historic distribution and the populations recorded in 1991 make up the majority of known locations. Threats to this species are likely to include severe livestock grazing, and the loss of habitat due to oil and gas development and rural development.

PANOCHE PEPPERGRASS - LEPIDIUM JAREDII SSP. ALBUM

Panoche peppergrass has not been given special status by either the U.S. Fish and Wildlife Service or the Calif. Dept. of Fish and Game. However BLM considers panoche peppergrass as a special status species because it is only known at five locations (four of which are on public lands within the Hollister Resource Area) and it has not recently been observed at several historical locations.

The historical distribution of Lepidium jaredii ssp. album is the eastern base of the San Benito Mountain-Joaquin Ridge portion of the Inner South Coast Ranges and the western edge of the San Joaquin Valley from Panoche Creek south to the Coalinga area in Fresno County (PGT-PG&E 1990).

Currently, Panoche peppergrass is known to occur in two areas in the Hollister Resource Area (the south side of Vallecitos Valley and in the Arroyo Hondo watershed, both in Fresno County) and one location in the Caliente Resource Area (near Orchard Peak in San Luis Obispo County). Oil and gas development is declining in the Vallecitos area where it is unknown if past oil and gas development has impacted Panoche peppergrass. Oil and gas activity has not yet occurred in the Arroyo Hondo watershed and this area has a moderate oil and gas potential.

The habitat for Panoche peppergrass is alluvial fans and washes that empty into the west side of the San Joaquin Valley and the watersheds (which are vegetated mostly by annual grasslands) above them. Upland populations are found on extremely hard-packed, fine clay soils which resemble cement. Little is known of Panoche peppergrass. Potential conflicting land uses could include sand and gravel mining, grazing, or severe surface-disturbing activities.

WILDLIFE

The Hollister Resource Area contains approximately 300 species of wildlife including numerous birds, mammals, reptiles, and amphibians. Since management of each individual species is not practical, BLM management has focused on species of economic interest, threatened or endangered species, and preservation of natural habitats and habitat diversity.

Most oil and gas activities are expected to occur in or around the Coalinga/Avenal oil fields which are dominated by non-native grasslands and saltbush steppe communities. Common wildlife species include side-blotched lizards, coyotes, hares, horned larks, lark sparrows, and Heermann's kangaroo rats. Most of these species are associated with open habitats with shrubs and/or burrows often used for cover. These areas also provide important habitat for several threatened or endangered species which are discussed under a separate heading in this chapter. They also provide habitat for California quail and desert cottontail rabbit populations which support some hunting opportunities.

Portions of Williams Hill are also given a high oil & gas potential and could be affected by oil & gas development. These public lands are located in the chaparral-covered hills between San Ardo and Lockwood. These hills are considered important wildlife habitat for the Santa Lucia deer herd. The habitat is in poor condition because of over-mature brushfields due to fire suppression or exclusion (USDI 1983). Due to large expanses of late successional chaparral, species diversity is considered low. The most important wildlife habitats are in riparian zones and in oak woodlands where animal abundance and diversity increases.

THREATENED, ENDANGERED AND OTHER SPECIAL STATUS ANIMALS

There are five endangered animal species found in the Hollister Resource Area. In addition there is historic habitat for the endangered California condor. There are two additional endangered species found in the region which have no suitable habitats on public lands. Table #5 lists these eight endangered species. There are no threatened species found in the resource area.

The endangered San Joaquin kit fox, blunt-nosed leopard lizard, and giant kangaroo rat could be affected by oil & gas activities on public lands in the resource area. Habitat for these three species is depicted on Map #8.

The five other endangered species would not be affected by oil & gas activity on public lands. There is no habitat on public lands for the Fresno kangaroo rat or the Least Bell's Vireo. There are no known nesting sites for the American peregrine falcon. There would be no impact to winter habitat for the southern bald eagle near Squaw Leap and Hernandez Reservoir. Future reintroduction of California condor into the wild is not expected to result in recolonization of historic sites in the Hollister Resource Area.

In addition to these endangered species, there are also 20 other special status species that are listed as "candidate" species. These are species that are currently being considered for designation as threatened or endangered. One of these species, the San Joaquin Dune Beetle, is a Candidate 1 species which means that sufficient information exists to warrant placement of

this species on the threatened or endangered list. The remainder are Candidate 2 species, which means they are rare and under threat but insufficient information is available to permit listing as threatened or endangered. These candidate species are listed on Table #6.

The only candidate species that could be affected by oil & gas activities on public lands are the San Joaquin antelope squirrel, the short-nosed kangaroo rat, the big-eared kangaroo rat, and five rare beetles (San Joaquin dune beetle, Ciervo aegialian scarab beetle, Hoppings blister beetle, maleston blister beetle, and Morrison's blister beetle). While several studies have been conducted on these three small mammals, data are lacking on the five beetles. Additional site-specific analysis may be necessary to minimize impacts to these invertebrates.

The remaining candidate species do not occur on public lands or occur in restricted habitats that can be avoided by routine mitigation. Species that do not occur on public lands include the California tiger salamander, California red-legged frog, Southwestern pond turtle, spotted bat, and Monterey/Salinas ornate shrew. Species that occur in very specialized habitats and can be readily avoided by application of standard lease conditions include the San Joaquin dune beetle, tri-colored blackbird, California mastiff bat, and the San Joaquin pocket mouse.

Stipulations prohibiting surface occupancy within 1/2 mile of active raptor nests during the nesting and fledgling season is expected to preclude any impacts to golden eagles or other raptor species.

Following the tables are more detailed descriptions of those special status species that could be affected by oil & gas activities on public lands in the resource area.

TABLE #5
ENDANGERED ANIMAL SPECIES IN THE HOLLISTER RESOURCE AREA

SPECIES	LEGAL STATUS FEDERAL/STATE	KNOWN LOCATIONS	HABITAT
San Joaquin Kit Fox Vulpes macrotis mutica (1,3)	FE/ST	Panoche Valley/ Kettleman Hills	saltbush gassland
Blunt-nosed leopard lizard Gambelia silus (1,2,3)	FE/SE	Panoche to Kettleman Hills	grassland/ washes
Giant Kangaroo Rat Dipodomys ingens (1,3)	FE/SE	West of I-5	grassland
Fresno Kangaroo Rat Dipodomys nitratoides exilis (1)	FE/SE	Kings County	grassland
California Condor Gymnogyps californianus (2,3)	FE/SE	Castle Mt.	Nest site
Bald Eagle Haliaeetus leucocephalus (2)	FE/SE	Hernandez Res. Squaw Leap	Lakes
American Peregrine Falcon Falco peregrinus anatum (2)	FE/SE		
Least Bell's Vireo Vireo bellii pusillus (1)	FE/SE	Bradley/San Ardo	riparian

(1) Reference from California Natural Diversity Data Base
(2) Reference from California Wildlife and Fish Habitat Relationships System.
(3) Reference from Hollister Resource Area known locations map records.

TABLE #6
"CANDIDATE" ANIMAL SPECIES IN THE HOLLISTER RESOURCE AREA

SPECIES	LEGAL STATUS FEDERAL/STATE	KNOWN LOCATIONS	HABITAT
San Joaquin Dune Beetle Coelus gracilis (1,3)	C-1/--	Monocline Ridge Ciervo Mountain	sand dunes
Ciervo Aegialian Scarab Beetle Aegialia concinna (1)	C-2/--	Ciervo Hills	sand dunes
Hoppings Blister Beetle Lytta hoppingi (1)	C-2/--	Coalinga	grassland
Molestan Blister Beetle Lytta molesta (1)	C-2/--	Panoche Hills	saltbush/ grassland
Morrison's Blister Beetle Lytta morrisoni (1)	C-2/--	Griswold	grassland/ Ephedra
California Tiger Salamander (2) Ambystoma tigrinum californiense	C-2/SSC		ponds, grasslands
California Red-legged Frog Rana aurora draytoni (2)	C-2/SSC		streams/ ponds
Southwestern Pond Turtle Clemmys marmorata pallida (2)	C-2/SSC		streams/ ponds
Golden Eagle Aguila chrysaetos (2)	C-2/SSC	Panoche to Kettleman Hills wetlands	grasslands, scrublands,
Tri-colored Blackbird Agelaius tricolor (1)	C-2/SCC	Little Panoche Creek	Cattails, wetlands
Monterey Ornate Shrew Sorex ornatus salarius (2)	C-2/--	Salinas River delta	Riparian

Spotted Bat Euderma maculatum (2)	C-2/--	East side San Joaquin valley	Ponderosa desert
California Mastiff Bat (2) Eumops perotis californicus	C-2/CSC	Salinas River drainage, Silver Silver Creek drainage	crevice/ trees buildings
San Joaquin Antelope Squirrel Ammospermophilus nelsoni (1,3)	C-2/ST	Panoche Hills to Coalinga	saltbush/ grassland
Big-eared Kangaroo Rat Dipodomys elephantinus (1,2)	C-2/--	Clear Creek Cantua Cr.	sagebrush scrub/chap
Short-nosed Kangaroo Rat (2) Dipodomys nitratoides brevinasus	C-2/CSC	Coalinga to Kettleman Hills	grassland
San Joaquin Pocket Mouse (1) Perognathus inornatus	C-2/--	East side San Joaquin Valley	sand dunes, grasslands

(1) Reference from California Natural Diversity Data Base
(2) Reference from California Wildlife and Fish Habitat Relationships System.
(3) Reference from Hollister Resource Area known locations map records.

SAN JOAQUIN KIT FOX

The kit fox is listed as endangered by the U.S. Fish & Wildlife Service. Detailed information on the biology of the kit fox is summarized in the species recovery plan (USFWS 1988). Originally it was a relatively common carnivore of the semi-arid habitats of the San Joaquin Valley from San Joaquin and Stanislaus counties south to Kern County (O'Farrell 1983). Starting in the early 1900s, agricultural, industrial, and urban developments brought about rapidly increasing rates of habitat loss that eventually led to population declines. Declines were through displacement, direct and indirect mortalities and reduction of prey base. By 1979, less than seven percent of its original habitat remained (Steinhart 1990).

Kit fox habitat occurs in open grasslands and saltbush grassland covered hills, on slopes of less than thirty percent, west of Interstate 5 in western Fresno and Merced counties. In the Hollister Resource Area there are more than 80 known active kit fox dens. These dens are found on public lands in the Tumey Hills, Ciervo Hills, and in the Coalinga/Avenal area. More than half of the known occupied dens on public lands in the resource area are found near or in the oil fields of the Coalinga area, with more than 25 of the dens in the Kettleman Hills. Most of the remaining habitat areas have a high or moderate oil & gas potential.

Kit fox are known to inhabit low to moderate intensity oil fields. While these animals continue to occupy such areas, individuals may be affected by direct loss of habitat or prey, contaminants, vehicle collisions, den entrapment, and degradation of habitat. Recent studies in Kern County indicate significant use of oil field pipe for den use.

Kit fox are primarily nocturnal but recent studies show that diurnal hunting occurs where diurnal prey is utilized. Adults and pups sometimes rest and play near the den entrance in the afternoons, but most activities commence near sunset and continue sporadically throughout the night. Kit fox occupy small individual dens. Kit fox dens may have one or numerous entrances. The kit fox's large home range covers an area of one to two square miles.

BLUNT-NOSED LEOPARD LIZARD

The blunt-nosed leopard lizard is listed as endangered by the U.S. Fish and Wildlife Service. Detailed information on the biology of this species is contained in the revised recovery plan (USFWS 1985). This lizard once ranged through the San Joaquin Valley at least to Modesto and perhaps San Joaquin County (USFWS 1985). This species is now limited to scattered parcels of undeveloped land on the San Joaquin Valley floor from southern Merced County to western Kern County. The leopard lizards recent decline in its range and numbers is the result of a rapid increase in leveling and cultivating of arid lands in the San Joaquin Valley. It still occurs in most of its original habitat in the foothills on the western side of the valley. High-quality habitat declined from 228,000 acres in 1976, to 141,500 acres in 1979. By 1983, only about 104,500 acres remained. In 1990, less than seven percent of the San Joaquin Valley remained unaltered by agriculture or urban development (Steinhart 1990).

In the Hollister Resource Area blunt-nosed leopard lizards have been observed in the Panoche Hills, Tumey Hills, and in the Coalinga/Avenal area. Most of the sightings of this species in the resource area have been in the Coalinga/Avenal area. Many of the sightings have been within the developed oil fields. The remainder of the habitat areas generally have a high or moderate oil & gas potential.

Individual leopard lizards may emerge from hibernation as early as late March. By mid-April, most individual lizards are active. Timing of spring emergence is strongly temperature dependent. Activity is generally bimodal, and confined to morning and afternoon hours. The first eggs are deposited from early June to mid-July at the far end of a rodent burrow. The majority of hatchlings emerge in early August. Hatchlings may be active as late as mid-October. Both adults and hatchlings remain inactive underground in rodent burrows during winter.

Abandoned or occupied burrows of kangaroo rats and abandoned squirrel burrows are utilized for permanent shelter. Studies show that the lizards are absent or rare in hilly terrain, but favor adjacent lower slopes and wash systems. Distribution is often discontinuous and densities are low and extremely variable. Higher densities are one to three per acre on valley floor habitats. Available information on adjacent foothills and plains suggests a density under optimal conditions of less than 0.5 lizards/acre. Tollestrup (1982) estimated that one section of land is the minimum area necessary to perpetuate an isolated population in good habitat.

GIANT KANGAROO RAT

The giant kangaroo rat is listed as endangered by the U.S. Fish & Wildlife Service. This species was once common across the western San Joaquin Valley from Merced County south, on the Carrizo Plain, and in the Cuyama Valley. Between 1972 and 1980 most of the areas inhabited by giant kangaroo rats were converted from native vegetation to cultivated agricultural crops. The loss of original habitat to agricultural conversion may be as much as 97-98 percent. Five relatively small areas totaling 12 square miles remain that support population densities typical of those existing prior to 1950.

Williams considers the giant kangaroo rat to be a good indicator of the health of remnant San Joaquin Valley endangered species habitats (Williams 1985). Kangaroo rats are an important component in the diet of the kit fox. Their burrow systems are used by blunt-nosed leopard lizards and San Joaquin antelope ground squirrels are found in giant kangaroo rat colonies.

In the Hollister Resource Area giant kangaroo rats are found in the Panoche, Tumey, and Ciervo hills. Most of the habitat is in areas of high or moderate oil & gas potential. Colonies found on public lands are not very large and are very susceptible to any disturbance. Monitoring has indicated that population numbers declined between 1980 and 1985 (USDI 1987).

Giant kangaroo rats live in colonies, each rat maintaining a burrow system about twenty feet in diameter surrounded by the burrows of neighbors. Burrow systems often consist of an average of seven entrances measuring 2.5-3.5 inches in diameter.

SAN JOAQUIN ANTELOPE SQUIRREL

The San Joaquin antelope squirrel is listed as a Candidate 2 species by the U. S. Fish & Wildlife Service and is listed as threatened by the California Department of Fish & Game. Before irrigation came to the Central Valley, the San Joaquin antelope squirrel inhabited 3.4 million acres of arid, sparsely vegetated grasslands. Today less than one hundred thousand acres of the grassland that remains is in adequate condition to support the species (Steinhart 1990). Recent surveys indicate that 80 percent of the original geographic range of antelope squirrels has been converted to agricultural developments (Harris 1989). No prime habitat remains.

Low populations estimated by Harris (1989) at less than one squirrel per hectare occur in the Panoche and Tumey Hills. These areas have a moderate oil & gas potential.

These squirrels can tolerate much higher body temperatures than normal (up to seven degrees) than can most mammals. This allows them to remain active longer during the hottest part of the day (Steinhart 1990). Burrows used by this species are either dug by them or by other rodents including giant kangaroo rats. These burrows and the shade of large saltbush shrubs are important for thermal regulation and escape cover. Habitat lacking these components are often unsuitable to support these animals.

BIG-EARED KANGAROO RAT

The big-eared kangaroo rat is listed as a Category 2 species by the U.S. Fish & Wildlife Service. This species has not been studied since the 1930's. Williams (1986) finds no justification for recognizing *elephantinus* as a species separate from narrow-faced kangaroo rat. He has concluded that there is no justification to be concerned about the survival of this "species."

This species is found in sage/buckwheat chaparral vegetation areas in the vicinity of Clear Creek and Cantua canyons. These areas have moderate or no oil & gas potential.

VISUAL RESOURCES

The landscape of the BLM lands in the Hollister Resource Area range from nearly level to rugged mountainous terrain located generally in rural ranching areas. Vegetation includes forested areas, chaparral, and open grassland. Cultural modifications of the public lands typically consist of range management projects such as fence lines, and livestock and wildlife

water developments. Electrical transmission lines, radio communication towers, water storage tanks, hiking trails, etc. are also located on some BLM lands.

There are approximately 315,000 acres of BLM public lands within the five county Hollister Resource Area. In most of the resource area the scattered public lands are a small portion of the overall landscape. Only a few portions of these public lands have outstanding scenic quality. The visual resources are particularly important on the public lands adjacent to the Pinnacles National Monument (National Park Service), lands adjacent to the Ventana Wilderness (U.S. Forest Service), and lands highly visible from I-5 and Highway 101. For additional discussion of visual aesthetic qualities per the Clean Air Act see the section on air quality in Chapter 3.

BLM lands in the resource area were inventoried for scenic quality in 1979. These inventories were used in 1984 when resource area lands were all assigned to one of four Visual Resource Management (VRM) classes (see Table #7) when the Hollister Resource Management Plan.

In addition to the BLM lands there are approximately 380,000 acres of privately owned lands where the U.S. has retained some or all of the mineral rights. The visual resources of these lands are similar to those of the BLM lands except there are scattered ranch buildings and a small portion of the lands have been converted to irrigated farm lands.

VISUAL RESOURCE MANAGEMENT CLASSES

Each visual resource management (VRM) class consists of guidelines for the amount of acceptable change in the visual resources. A VRM class is based on the physical and sociological characteristics of any given area and serves as a management objective. The VRM classes are designated through the land use planning (RMP) process. Following is a description of the various VRM class objectives:

> Class I - The objective of this class is to preserve the natural character of the landscape. This class provides for natural ecological changes however very limited management activity is allowed. Changes to the existing landscape should be of minimal visual impact and man's actions must not attract attention.
>
> Class II - The objective of this class is to retain the natural character of the landscape. Changes are permitted but the visual impacts of the change should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the area.
>
> Class III - The objective of this class is to partially retain the existing character of the landscape. There should be no more than a moderate level of change to the visual resources of the area. Management activities may attract attention but should not

dominate the view of the casual observer. Changes should repeat the basic elements found in the predominate natural features of the area.

Class IV - This class provides for management activities which require major modification of the landscape. The level of change to the landscape can be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impacts of these activities through careful location, minimal disturbance, and repeating the basic elements of the natural landscape.

DESCRIPTION OF AFFECTED AREAS

Table #7 is a summary of VRM classifications, VRM sensitivity, and O&G potential for public lands in the Hollister Resource Area. Visual resources would not be affected in areas with no O&G potential. The application of standard mitigation measures would also be sufficient to preclude any loss of visual resource values in areas with moderate O&G potential, and moderate or low visual sensitivity. The following detailed descriptions cover those areas where oil & gas activities could impact visual scenic values. Scenic values generally depend on four factors: 1) the character of the natural landscape, 2) the extent of cultural modifications already present in the landscape, 2) the scenic quality of the landscape which is determined by evaluating the first two factors, and 4) visual sensitivity which considers how many people see the landscape, where they see it from, and how sensitive they are to modifications of the landscape.

TABLE #7
VISUAL RESOURCE MANAGEMENT CLASSIFICATION

Resource Management Area	*VRM Classification*	*VRM Sensitivity*	*O&G Potential*
San Benito Natural Area	I	Moderate	None
Pinnacles Watershed	II	High	Mod-None
Panoche Hills	III	High	Moderate
Ciervo Hills/Joaquin Rocks	III	High	Moderate
Griswold/Tumey Hills	III	Moderate	High-Moderate
Condon Peak	III	Moderate	Mod-None
Pinnacles Mgmt Area	III	Low	Mod-None
Coalinga Mineral Springs	III	Low	Moderate
Squaw Leap	III	High	None
Sierra de Salinas	III	Low	None
Williams Hill	IV	Moderate	High-Moderate
Clear Creek	IV	Moderate	None
Coalinga	IV	Low	High
Central San Joaquin	IV	Low	High
Gabilans-Diablo	IV	Low	Moderate
Call Mt./Hernandez Valley	IV	Low	High-Moderate
Parkfield	IV	Low	Moderate

EXISTING OIL FIELDS

Existing oil fields are located in the Coalinga/Avenal, Williams Hill (San Ardo), Griswold/Tumey Hills (Vallecitos) Management Areas. There is a federal interest in the oil produced from seven different oil fields.

Landscape Character - Most of the oil fields near Coalinga and Avenal in western Fresno County contain annual grasslands and low shrubs in the undisturbed areas. In the five fields with some federal mineral interest the topography ranges from nearly level to rugged deeply dissected hills.

The small Vallecitos Field is located in a remote ranching valley in eastern San Benito County. The mostly level ranching valley is surrounded by steep mountainous hillsides.

The San Ardo Field in southern Monterey County is located primarily on terraces of the Salinas River valley although a few wells are present on the adjacent rolling hillsides.

Cultural Modifications - The fields around Coalinga and Avenal are extensively developed with wells, pumping facilities, storage tanks, roads, etc. dominating the landscape. In the Vallecitos Field however wells and related facilities are scattered with only a few being readily visible from New Idria Road. Cattle grazing with fence lines, water troughs, and ranch buildings are the prevalent view throughout the Vallecitos Field. The San Ardo Field although covering a fairly small area is very intensely developed and has the appearance of an industrial area.

Scenic Quality - The oil fields around Coalinga and Avenal are of a low scenic quality with the oil fields, farming, residential, and commercial developments dominate the landscape. The Vallecitos Field area is of a low to moderate scenic quality. While the grazing facilities and some of the oil field developments in the foreground/middleground are the most prevalent features of the area, the chaparral and forested background provide variety and a somewhat greater scenic quality. The very intensely developed San Ardo field has a very low scenic quality with the intensively developed industrial facilities of the oil fields dominating the landscape.

Visual Sensitivity - Portions of the Coalinga and Avenal area oil fields are visible from I-5, Highway 198 and Highway 33. The San Ardo field is located immediately adjacent to and is highly visible from Highway 101. Due to existing wellhead structures, roads, and related facilities these oil fields are not considered to be visually sensitive. The lightly developed Vallecitos Field is located in a remote ranching valley in eastern San Benito County and has a low visual sensitivity.

Interstate 5 Corridor

Portions of the Panoche Hills, Ciervo Hills/Joaquin Rocks, and Griswold/Tumey Hills Management Areas are visible from the I-5 Interstate Highway corridor. I-5 is the only north-south interstate freeway on the west coast of the continental United States and receives heavy truck and passenger vehicle traffic. The majority of vehicles are long distance through traffic going between the major population centers in northern and southern California. Within the Hollister Resource Area it runs generally along the boundary between the San Joaquin Valley to the east and the edge of the coastal mountain ranges to the west.

Landscape Character - Along most of the I-5 corridor the valley plane slopes gently to the east while the deeply dissected foothills of the coast range lie to the west. In Merced County the freeway runs mostly at the base of the foothills and the dissected drainages are easily seen. In Fresno County the foothill areas are generally several miles west of the freeway and appear more as rolling hills.

The valley plain for the most part is laid out in rectangular irrigated farm fields. The color and texture varies with the type of crop being grown and the time of year. Irrigation canals snake across the landscape in some areas. Most of the land east of I-5 is irrigated farmland. Pockets of irrigated farmland are also located west of the freeway.

The foothills of the coast range are rolling and deeply dissected. The vegetation is dominated by annual grasslands with scattered low shrubs in a few places. The fine uniform texture of the annual grassland vegetation blurs the edges of the hills and canyons and makes the hillsides appear to the casual observer as more gentle and rolling than is actually the case. The annual grasses are green in the winter and spring and a golden tan during the dry summer and fall months. The few powerlines, roads, and rock outcrops have little impact on this otherwise uniform appearing landscape.

In northwest Fresno County, Ortigalita Ridge is readily visible in the background views from I-5. North of Coalinga the Joaquin Ridge and peaks of the Diablo Range rise above the foothills and are also visible from I-5. The Joaquin Rocks are a prominent geologic feature visible on the horizon to southbound traffic.

Cultural Modifications - The agricultural fields, buildings, houses, and roads are prevalent in most of the I-5 viewshed. High voltage power lines, water tanks, irrigation canals, etc. are present in most areas. Commercial roadside services are located at several of the freeway interchanges. The main radio tower on Panoche Mountain can be seen from the freeway, especially to south bound traffic. To a lesser degree the radio towers on Black Mountain north of Coalinga, are also noticeable especially to northbound traffic.

Scenic Quality - The scenic quality of the irrigated farmlands is fairly low. The large expanses of farmland with little other development form a pleasant but somewhat uniform setting. The annual grassland hillsides are of a fairly regular pattern with few special features to provide variety, especially in Merced County. In a few locations the rugged peaks and the chaparral and forest vegetation of higher ridgelines can be seen as background views from I-5.

In Fresno County there is greater variety with the irrigated farmlands generally next to the freeway and rolling hills behind the fields to the west. These areas are of low to moderate scenic quality. North of Shields Avenue the mountainous Ortigalita Ridge is readily visible in the background. Also near Kamm and Derrick Avenues the chaparral and forested background of the Joaquin Ridge come into view. These sections are of moderate scenic quality. Near Coalinga the terrain is more open. From I-5 the oil fields, farm and ranch lands, and commercial developments dominate the viewshed from and the scenic quality is low.

Visual Sensitivity - Views from the I-5 corridor are made from passing vehicles on the freeway at about 65 miles per hour. The majority of the traffic is through traffic which may stop only to use roadside services, to change drivers, or for a rest stop.

A large block of public lands in the Panoche Hills lies one to three miles west of the freeway between the Shields Avenue and Panoche Road freeway interchanges. The sloping front sides of these hills are readily visible from the highway. However due to their generally rounded form, grass covered slopes, and lack of development they do not draw attention but instead form a backdrop to the irrigated farm fields in the foreground. The public lands in the Panoche Hills form an important part of the viewshed from I-5 in this area. A radio repeater tower on Panoche Mountain is readily noticeable from the freeway, especially to southbound traffic, but it is four miles away at its closest point. The Panoche Hills area is visually very sensitive to any development.

Public lands west of the freeway and south of the Panoche Road interchange in the Tumey and Ciervo Hills are also visible from the highway. However most of the area visible in the foreground and middle ground is privately owned. Topographic screening and distance hides much of the BLM lands in this area. However those lands that are seen are an important part of the scenery and are sensitive to any development.

Some parcels of land with federal mineral rights are located adjacent to or near the freeway on both sides of the highway. Due to their high visibility from the highway these parcels have a very high visual sensitivity to development activities.

Visual Resource Management Class - The scattered BLM lands in Merced County are classified as VRM Class IV as are the BLM lands in and around the developed oil fields near Coalinga. The Panoche Hills, Griswold/Tumey Hills, and Ciervo Hills/Joaquin Rocks are classified as VRM Class III.

Williams Hill

Williams Hill is a block of public lands located about five miles west of Highway 101 between San Lucas and San Ardo in southern Monterey County. In addition privately owned lands with federal mineral rights lie two to five miles west of the highway.

Landscape Character - This area consists of rugged chaparral and grey (digger) pine covered slopes, annual grasslands, and dry farmed valleys. The lands visible from Highway 101 are of a fairly uniform dark green color except for the annual grasslands which are green in the winter and spring and a golden tan during the dry summer and fall months. Communication sites on the ridges are visible against the skyline to southbound traffic.

Cultural Modifications - The communication sites on the ridgeline are readily visible from Highway 101. Vineyards are present next to the highway near San Lucas and ranch lands in the rest of the area.

Scenic Quality - The variation in topography, colors, and mostly natural character of the landscape gives this area moderate to good scenic quality.

Visual Sensitivity - These lands are highly visible from Highway 101 and provide a scenic background to the west side of the highway. Traffic on highway 101 in Monterey County south of Salinas is light to moderate. There is a mixture of local traffic and through traffic between cities up and down the central California coast. Some long distance recreational traffic uses highway 101 as a scenic alternative to Interstate-5.

Visual Resource Management Class - The public lands in the Williams Hill area are designated as VRM Class IV.

Pinnacles Area

BLM lands and private lands with BLM administered minerals are found adjacent to and near the Pinnacles National Monument. The areas to the northeast of the National Monument have a moderate potential for the occurrence of oil and gas deposits. Other areas to the north, west, south and southeast of the National Monument are believed to have no potential for oil and gas potential.

Landscape Character - This area consists of rugged chaparral covered slopes in the Gabilan Mountain Range. Chamise chaparral is found mainly on south facing slopes and contains some digger pines in scattered favorable locations. Mixed chaparral occurs with manzanita, digger pines, buckbrush, and scrub oak being some of the primary species. The chamise chaparral areas have a fairly low degree of texture with a mostly uniform

color. The mixed chaparral areas have a more rugged texture and greater color contrasts.

Cultural Modifications - There is a CDF lookout tower on North Chalone Peak within Pinnacles National Monument that is visible from various locations throughout the area. High power electrical transmission lines are present in the north and west. Ranch buildings and facilities are located on the private lands.

Scenic Quality - Scenery outside of the National Monument is common to the region. The variation in topography, colors, texture and mostly natural character of the landscape gives this area a moderate scenic quality.

Visual Sensitivity - Much of the BLM area is either visible from hiking trails within the National Monument or from the state highways going to the Monument. Highways 25 and 146 lead to the east side of the Monument and highway 146 out of Soledad goes to the west side. Both the BLM lands and the private lands with BLM managed minerals in the area near Pinnacles National Monument have a high visual sensitivity.

Visual Resource Management Class - The public lands in the watershed area of the Pinnacles National Monument has been designated as VRM Class II with the remainder of the area designated VRM Class III.

WATER QUALITY

SURFACE WATER

Water quality and availability varies greatly within the Hollister Resource Area. Most of the area which could be impacted by the federal oil & gas lease program have few perennial streams and springs of good quality water.

Much of the resource area is characterized by steep terrain with highly erosive soils. Most of the seasonal runoff occurs during storms during the winter and early spring, often with most of the total yearly discharge coming down these stream channels in a single two or three day storm period. These waters carry a high percentage of sediment during runoff periods. California code, however, does not permit the construction of oil or wastewater sumps in natural drainage channels (per Title 14 CCR, Section 1770a) (SWRCB 1975). Lessees are also required to notify the Regional Water Quality Control District before use of sumps for crude oil or wastewater is allowed.

During 1982 the BLM conducted an inventory of water resources in the resource area (USDI 1983). A review of the stream inventory and oil & gas occurrence potential maps (Milliken 1990a) indicates that Silver Creek is probably the only perennial stream that could be impacted by oil & gas production on federal leases. Silver Creek flows through the Vallecitos oil field where there are 8,000 federal acres under lease and 13 producing wells on federal leases.

In 1989 an oil spill from a storage tank on a federal lease in the Vallecitos field resulted in temporary contamination of the Silver Creek drainage. In 1988 a large oil spill occurred when a pipeline erupted on a federal lease in the Coalinga area resulting in spillage of 20,000 to 30,000 barrels of oil (Milliken 1990c). The Coalinga spill did not impact water quality but is cited to emphasize that large oil spills can and do occur on federal oil leases.

GROUNDWATER

Most oil & gas exploration and development activity on federal leases is expected to occur in the Coalinga vicinity. The quality of groundwater in this area is poor. The water contains high concentrations of sodium and sulfates. The groundwater has also been contaminated by past oil field waste disposal practices (FCPC 1980). Because the groundwater is of poor quality, drinking water is imported under contract from the U.S. Water and Power Resource Service. The groundwater is, however, managed for other beneficial uses including agricultural and industrial supply.

Activity on federal leases could also affect groundwater near the San Ardo and Vallecitos oil fields. Groundwater near the San Ardo oil fields is high in sulfur, but water quality of the downstream Salinas Valley aquifer is good (Monterey County 1987). Silver Creek, the principle drainage in the Vallecitos Oil Field, is part of the Tulare Lake groundwater basin which is managed for municipal, agricultural, and industrial supply.

FLOODPLAINS

Most of the public land in the Hollister Resource Area is located in rugged steep terrain characterized by narrow confined drainages. Consequently most floodplains are limited to narrow ribbons adjacent to these deeply incised drainages. Many areas in the vicinity of the Coalinga/Avenal area oil fields are susceptible to flooding. Review of the 100-year flood zone maps, however, indicate that no public lands in the oil field area are within the mapped flood zone (FCPC 1980). Much of the San Ardo oil field in south Monterey County is within the 100-year floodplain of the Salinas River (MCPD 1987). Public lands within the San Ardo oil fields appear to be within the floodplain.

SOILS

There are 17 soil associations that occur on the public lands in the Hollister Resource Area with hundreds of soil types. Erosion potential of soils in this region is generally related primarily to slope. Areas below 30% slope generally have low to moderate erosion potential while areas above 30% slope have high erosion potential (Monterey County 1987). High concentrations of selenium have been recorded in soils derived from Moreno formation sediments.

Most soil disturbing activities on federal oil & gas leases is expected to occur in and around the Coalinga/Avenal oil fields. Soils in this area are generally Cantua or Kettleman-Cima associations. These soils are generally sandy, loamy soils overlying highly weathered calcareous sandstones with a moderate to sparse vegetative cover. Runoff is slow with most areas having a moderate erosion potential. Kettleman soils on south and west slopes have a high erosion potential (Anderson 1967).

OIL AND GAS RESOURCES

There are currently 14,780 acres of federal lands leased for oil & gas exploration and development within developed oil fields in the Hollister Resource Area. These lands are in the Vallecitos (8,000 acres), Coalinga (3,000 acres), Kettleman North Dome (2,560 acres), Jacalitos (700 acres), East Coalinga Extension (480 acres), and San Ardo (40 acres) fields. There are 128 producing oil & gas wells on BLM administered federal leases in the Hollister Resource Area. Most of the producing wells are in the Coalinga vicinity with 46 wells in the Coalinga oil field, 31 in the Kettleman North Dome field, 17 in the E. Coalinga field, nine in the Jacalitos field, four in the Pleasant Valley field, and three in the Guijarral Hills. The only other producing wells on federal leases are 13 wells in the Vallecitos field and five wells in the San Ardo field. Oil production figures for these fields is summarized in Table #8.

The U.S. Geological Service predicts there are over two billion barrels of undiscovered recoverable reserves in the 35 oil and gas fields in the Hollister Resource Area. The largest field, Coalinga accounts for almost half of the reserves. The top four fields, Coalinga, East Coalinga Extension, Kettleman North Dome, and San Ardo account for 88% of the resource area's remaining reserves (Milliken 1990a).

In 1988 there were a total of 5,996 producing wells in the resource area. One-hundred and twenty-eight of these wells or about 2% of the producing wells are located on federal leases administered by the BLM. Since 1979 oil production has been steadily increasing in the Coalinga field, holding steady in the East Coalinga field, and declining in San Ardo (Milliken 1990c).

About 40% of the public land in the resource area is currently under lease for oil & gas exploration and development. Areas currently under lease are depicted on Map #2. During the past five years there has been an average of about one wildcat exploration well drilled each year. BLM petroleum geologists have recently completed studies of oil & gas potential within the resource area (Milliken 1990a). The resource area has been divided into areas of high, moderate and no oil & gas potential. These areas are depicted on Map #2. Most of the high potential areas are in or adjacent to the producing oil fields. The areas with "no O&G potential" are underlain with Franciscan and intrusive basement rocks.

Based on these studies and evaluation of historic trends BLM petroleum geologists have projected that "the probability of a new field discovery on public lands in the Hollister Resource Area over the plan life (15 years) is less than 5%" (Milliken 1990d).

TABLE #8
OIL AND GAS PRODUCTION IN THE HOLLISTER RESOURCE AREA (1981)

Oil Field	*Federal Acreage*	*% Federal Acreage*	*Federal Production (Barrels/oil)*	*Total Field Production*	*% Federal Production*
Vallecitos	8,000	75.0%	3,394	50,314	6.7%
Coalinga	340	-	1,201	8,464,733	0.1%
Coalinga Nose	2,796	67.9%	3,740,173[1]	-	-
East Coalinga	480	0.9%	2,231	2,001,216	0.1%
Jacalitos	700	14.8%	11,440	67,549	16.9%
San Ardo	40	0.1%	13,180	10,229,425	0.1%
Kettleman North Dome	2,560	76.5%	180,651[2]	553,154[2]	32.7%
TOTALS	4,232		3,952,270	21,366,39	

(1) Unit Production
(2) Includes acreage and production in Caliente Resource Area

WILDERNESS

The Bureau of Land Management has recently completed extensive studies evaluating the wilderness potential of public lands in California. Within the Hollister Resource Area three Wilderness Study Areas (WSAs) were evaluated in the Central California Wilderness Study (USDI 1989). These areas are the Panoche Hills South WSA (6,677 acres), the Panoche Hills North WSA (11,267 acres), and the Pinnacles Wilderness Contiguous (5,838 acres).

None of these areas are currently under lease for oil & gas exploration and development. These areas would not be made available for leasing until Congress completes evaluations of their wilderness suitability and concurs with the BLM recommendation that they are not suitable for wilderness.

After extensive studies, the Bureau of Land Management has concluded that most of these areas are not suitable for wilderness. The only area being recommended to Congress for wilderness designation are 2,200 acres adjacent to the northern boundary of the Pinnacles National Monument (USDI 1989). This area is within the viewshed and watershed of the monument. It has been determined that this area has no oil & gas potential (Milliken 1990a).

The environmental impacts of oil & gas leasing on wilderness values was extensively analyzed in the Central California Study Areas Environmental Impact Statement (USDI 1989). Because this previous EIS addressed these impacts, no additional analysis is provided in this EIS.

CHAPTER FOUR
ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE "A" - CURRENT MANAGEMENT

REASONABLY FORESEEABLE DEVELOPMENT SCENARIO

This alternative is a continuation of current management practices. BLM geologists have developed "Reasonably Foreseeable Development" scenarios to provide a basis for impact assessment. The scenarios are based on the potential for oil and gas occurrence and the production history within the resource area. The scenarios provide anticipated levels of oil & gas exploration and development for the next 15 year period. These are not actions being proposed by the BLM, but are indirect actions that are expected to occur as a consequence of leasing. Affected acreage is summarized in Table #9. The detailed scenarios are available for review at the Bakersfield District BLM Office (see Milliken 1990c & 1990d). A more detailed description of surface disturbance resulting from oil & gas operations on public lands is contained in Appendix B. Anticipated levels of development under the Current Management Alternative (Alternative "A") are:

Within Existing Developed Oil Fields (see Map #2)

A) There would be long-term disturbance & occupancy of 450 acres and temporary disturbance of an additional 150 acres. This disturbance would include about 200 new wells and associated roads. Each new well is expected to result in average surface disturbance of about two acres. About 75 of these wells are not expected to be successful and the 150 disturbed acres would be reclaimed as soon as the exploratory drilling operation was completed. The remaining 125 wells are expected to be successful and would be put into production. This is expected to result in about one additional acre of disturbance per well for associated pipelines/roads. About 25 small tank farms are also expected to be developed to service these new wells. Each tank farm is expected to disturb about one acre and would consist of separators and three tanks. There could also be about 20 injection wells drilled to inject steam into the oil reservoir to enhance recovery of the oil. The injection wells would disturb about 50 acres. Additional auxiliary facilities are not expected to be constructed on federal lands nor would federal leasing require additional facilities beyond those built to service operations on private lands.

1) About 370 acres of this disturbance would be in the Coalinga/Avenal area oil fields.

2) Most of the remaining 230 acres of disturbance would be in the E. Coalinga or San Ardo oil fields.

B) During this same period about 100 production wells would be abandoned along with 20 associated tank farms. This would result in the reclamation of about 320 acres that are currently occupied by oil production facilities.

C) The net long-term disturbance over the next 15 years, resulting from new development offset by reclamation associated with the abandonment of existing wells, would be about 130 acres.

D) There could also be very transitory disturbance of an additional 140 acres resulting from seismic explorations. Temporary disturbances resulting from seismic exploration usually range from several trucks travelling along or adjacent to an existing road, to the drilling of numerous small "shot-holes" along a transect with each shot-hole disturbing about a 10-foot radius.

E) To provide a basis for the analysis of the cumulative impacts of oil & gas development and exploration, it is also necessary to review actions anticipated on private lands within the oil fields. Anticipated oil field development activities could affect a total of up to 12,400 acres within the developed oil fields. This sum is an aggregate of disturbance resulting from activity on both federal and private lands. Many of the affected acres on private lands have already been severely disturbed by historic oil field operations. This disturbance would result from the drilling of up to 4,000 new wells with about 2,500 resulting in production wells, and up to 450 injection wells. During this same period about 1,000 existing wells would be abandoned with reclamation of up to 2,200 acres.

Within Areas With High or Moderate Oil & Gas Potential (see Map #2)

A) The most probable scenario for federal leases is that there would be four to six unsuccessful wildcat wells. Each well would result in the temporary disturbance of up to two acres for a total disturbance of 16 acres. These areas would be reclaimed following completion of the drilling activities.

B) There is a less than 5% chance that there could be a new oil or gas field discovery on federal lands with "high" oil and gas potential. The probability of a new field discovery on "moderate" potential lands is therefore considered

remote. If a new field is discovered, it is expected to be relatively small with no more than 16 producing wells. Total surface disturbance from well pads, associated roads and pipelines, and tank farms would be about 55 acres.

C) There could also be a very transitory disturbance of an additional 180 acres resulting from seismic explorations. Temporary disturbances resulting from seismic exploration usually range from several trucks travelling along or adjacent to an existing road, to the drilling of numerous small "shot-holes" along a transect with each shot-hole disturbing about a 10-foot radius.

D) On both federal leases and private lands within the resource area, a total of up to 200 wildcat wells could be drilled resulting in the temporary disturbance of up to 400 acres. Up to ten new oil or gas fields could be discovered but it is anticipated these new fields would most likely be in the San Joaquin Valley within areas where the surface is already disturbed by agricultural and other development activities. These new fields could result in up to 160 new development wells with a total surface disturbance of up to 630 acres.

E) To address cumulative impacts it is also necessary to consider other actions that could affect environmental conditions. Anticipated actions on public lands include continued livestock grazing and increased recreation use. Private lands are expected to be affected by continued population growth, and subsequent urbanization and conversion of natural lands to urban and industrial uses.

Within Areas With "No" Oil and Gas Potential (see Map #2)

A) The most probable scenario for these areas is that there would be no oil and gas exploration or development activity, however other actions described in section E above are expected to also occur in these areas.

B) There is a less than 5% chance that there could be one or two exploratory wells resulting in the temporary disturbance of up to five acres.

TABLE #9
ALTERNATIVES "A, C, D, &E"
SUMMATION OF AFFECTED ACRES

O&G POTENTIAL	EXPLORATION TEMPORARY IMPACTS			DEVELOPMENT LONG-TERM IMPACTS			ABANDONMENTS RECLAIMED ACRES			NET LONG-TERM DISTURBANCE		
	BLM	PVT	TOTAL	**BLM**	PVT	TOTAL	**BLM**	PVT	TOTAL	**BLM**	PVT	TOTAL
Existing Oil Fields	**290**	3,000	3,290	**450**	11,950	12,400	**320**	2,200	2,520	**130**	9,750	9,880
High/Moderate O&G Potential												
Most Likely Scenerio	**195**	385	580	0	630	630	0	0	0	0	630	630
Less Than 5% Probability (Additional Impacted Acres)				**55**						**55**		
No Potential												
Most Likely Scenario	0	0	0	0	0	0	0	0	0	0	0	0
Less Than 5% Probability	**5**											
TOTAL AFFECTED ACRES	**490**	3,385	3,870	**505**	12,580	13,030	**320**	2,200	2,520	**185**	10,380	10,510

AIR QUALITY

This analysis focuses on ozone generating compounds and PM-10 since these are the pollutants that are currently impacting human health and public welfare in the region, and that are emitted by oil & gas exploration or development activities. Increases in emission of ozone generating compounds, reactive organic gases (ROGs) and nitrogen oxides, can result from exploratory drilling operations, and from the development of new oil wells and supporting facilities. Increases in fine particulate matter (PM-10) emissions can result from dust generated by seismic exploration activities, travel on paved and unpaved surfaces in conjunction with oil exploration or development activities, and indirectly from the emission of gases, such as reactive organic gases and nitrogen oxides, which are then turned into small particles in the atmosphere. For purposes of analysis it has been assumed that the drilling of new wells would be distributed evenly throughout the 15 year life of the plan.

SAN JOAQUIN VALLEY AIR BASIN

Lease operations on federal lands during the next 15 years are expected to result in the drilling of approximately 205 exploration & development wells, the development of 125 of these wells for oil or gas production, 25 new tank farms, and 20 injection wells. During this same period 100 existing wells, 20 tank farms, and the 80 unsuccessful wells would be abandoned. The net increase would be 25 new producing wells, five new tank farms, and 20 injection wells. Most of this activity is expected to occur within developed oil fields in the San Joaquin Valley Air Basin (Milliken 1990c).

Seismic exploration activities are not expected to result in measurable increases in PM-10 emissions if stipulations requiring dust emission controls are enforced.

The projected drilling of 225 new wells (205 exploration/development wells and 20 injection wells) would result in temporary increases in emissions of ROGs and nitrogen oxides. Emission studies contracted by the California Air Resources Board indicate the average new oil well drilled with diesel engines in the San Joaquin Valley results in emissions of about 610 lbs of nitrogen oxides, 24 lbs of ROGs, and 48 lbs of particulate matter (PM-10) (Dennison et al 1983). The 225 exploration, development, or injection wells would result in emissions of 137,250 lbs of nitrogen oxide, 5,400 lbs of ROGs, and 10,800 lbs of particulate matter. If this activity was evenly distributed over the next 15 years, average annual increase in emissions would be about 9,150 lbs of nitrogen oxides, 360 lbs of ROGs, and 720 lbs of particulate matter. These figures could be reduced significantly if the traditional diesel engines were replaced with gas or electric engines. In 1979 85% of the drilling rigs in the San Joaquin Valley were diesel powered (Dennison et al 1983).

The net increase of 25 producing oil wells and supporting tank farms would result in long-term increased emissions of ROGs and nitrogen oxides. There is also a less than 5% chance that there could be the discovery of a new oil or gas field on federal lands with as many as

16 new wells. Emissions in producing oil fields come from a wide variety of sources including tanks, well cellars, sumps and pits, valves, fittings, well heads, pumps, compressors, internal combustion engines, heater treaters, streamers and boilers, mechanical oil/water separators, fireflooding, and flares (Dennison et al 1983).

In 1979 KVB, Inc. prepared an analysis of emissions from crude oil production facilities in California for the California Air Resources Board. The analysis compiled emission data for each of the major oil fields in California. Based on this information an average well in Fresno County was estimated to annually emit about 2,365 lbs of reactive organic compounds, 1,120 lbs of nitrogen oxides, and 385 lbs of particulate matter (Dennison et al 1983). Based on this data the 40 new wells on federal leases would emit 94,600 lbs of reactive organic compounds, 44,800 lbs of nitrogen oxides, and 15,400 lbs of particulate matter. This assumes however that there has been no improvement in pollution emission technology in the oil fields since the base year of 1979. Since 1979 ROG emissions in the San Joaquin Valley have dropped about 30%. The imposition of more stringent controls on oil & gas production emissions is considered one of the major factors responsible for this reduction in ROG emissions. There has been no comparable drop however in emissions of nitrogen oxides or particulate matter (CARB 1988). Adjusting the above figures to account for the more stringent controls currently in place could reduce the expected emissions of reactive organic compounds to 66,220 lbs per year.

These figures for emissions from crude oil facilities do not include emissions from stream enhanced oil recovery well vents. While these vents can result in significant emissions of reactive organic compounds it is anticipated that requirements for centralized vapor recovery systems would fully control these emissions (Dennison et al 1983).

Based on this analysis the total net annual new emissions expected to result from federal O&G leases by 2005 would be 53,950 lbs of nitrogen oxides, 66,580 lbs of reactive organic compounds, and 16,120 lbs of particulates. It is anticipated that all of these emissions would occur in Fresno County. These emissions would represent a .1% increase in nitrogen oxide, a .1% increase in ROGs, and a less than .01% increase in particulates above Fresno County 1987 emissions (FAQCB 1987).

Cumulative Impacts

Cumulative impacts have been addressed by reviewing comparable oil & gas exploration/development activities that are expected to be occurring simultaneously on adjacent private lands. During the next 15 years it is anticipated that up to 4,450 new wells would be drilled on private lands with about 2,500 resulting in producing wells. During this period about 1,000 existing wells would be abandoned (Milliken 1990c). Using procedures outlined above, new well drilling on private lands would result in annual increased emissions of 180,965 lbs of nitrogen oxides, 7,120 lbs of ROGs, and 14,240 lbs of particulates. Development of new wells and supporting facilities would add annual emissions of 2,483,250

lbs of ROGs, 1,680,000 lbs of nitrogen oxides, and 577,500 lbs of particulates. Total annual new emissions from oil & gas activities on private lands by year 2005 would be 1,860,965 lbs of nitrogen oxides, 2,490,870 lbs of ROGs, and 343,480 lbs of particulates.

Emissions from oil & gas exploration/development activities on both federal and private lands by year 2005 are expected to result in a 2.9% increase in nitrogen oxide, a 3.8% increase in ROGs, and a 1.4% increase in particulates above Fresno County 1987 emissions. Current projections for emissions from all sources in the San Joaquin Valley forecast a 4% increase in nitrogen oxides, a 7% increase in ROGs, and 29% increase in particulate matter by the year 2000 (CARB 1988).

While a simultaneous reduction in both NOX and ROG produces significant reductions in ozone, reductions in only one pollutant can result in an increase or no change in ozone concentration. Despite a 30% drop in ROG emissions in the central part of the San Joaquin Basin (Fresno, Madera, Kings, & Tulare counties) indications are that ozone concentrations have increased (CARB 1988). No modelling of emission data was attempted in conjunction with this evaluation since the specific physical location of the projected emissions is hypothetical and the San Joaquin Valley Unified Air Pollution Control District 1991 Attainment Plan (SJVUAPCD 1992) indicates that effective models for the San Joaquin Valley have not been developed.

A review of this cumulative impact data would indicate that while projected emissions from federal O&G lease activities are inconsequential when viewed in isolation, that when viewed in conjunction with other activities they are part of a very substantial environmental degradation and health problem. The projected inability of the San Joaquin Valley Air Basin to meet federal standards for air pollutant emissions can be expected to result in lung damage to individuals with asthma or emphysema, and nausea, headaches, irritated eyes, and dizziness among otherwise healthy individuals, particularly the young and elderly, and in continued crop damage (current estimates place crop losses at 10 to 20%) (CARB 1989).

Mitigation

Proposed actions on federal lands are limited to the drilling of new wells, development of new wells, and construction of limited support facilities such as sumps, oil/water separators, and storage tanks.

The Regional Air Quality Control Boards currently require application of BACT control measures for permitted actions that exceed established thresholds. All lease activities that could contribute to air quality degradation should be required to get appropriate permits from the Regional Air Quality Control Boards.

The most significant mitigation measure that could reduce emissions from federal leases would be the substitution of electric or gas engines for diesel engines that historically

dominated the San Joaquin Valley oil fields. It is anticipated that the use of electric or gas engines would virtually eliminate nitrogen oxide and indirect particulate emissions associated with oil production since most of these emissions are the product of internal combustion engines (see figures in MBUAPCD 1989). They would also eliminate most ROG emissions associated with drilling of new wells.

Many diesel engines used in oil & gas production have been eliminated in recent years. In particular, the O&G industry working in cooperation with the BLM, has recently substituted natural gas for many diesel operated engines used for San Joaquin Valley steam enhancement operations. The Monterey Bay Unified Air Pollution Control District currently evaluates the potential to use electric engines in lieu of diesel engines when evaluating permit applications for new drilling rigs (see Chee 1990). The San Joaquin Valley Unified Air Pollution Control District is currently studying this issue with final implementation rules scheduled for adoption in 1994.

Covering oil production sumps with flexible membrane, rigid pontoon or fixed covers or replacing sumps with tanks could reduce ROG emissions associated with the sumps by about 90%. Unfortunately the sumps only account for about 5% of the ROG emissions (MBUAPCD 1989).

Installation of vapor recovery systems on storage tanks could also reduce ROG emissions. The Monterey Bay Unified Air Pollution Control District has evaluated sealed covers on air/water separators and has determined they are not an efficient pollution reduction method (MBUAPCD 1989).

NORTH CENTRAL COAST AIR BASIN

Activities anticipated on federal oil & gas leases within the North Central Coast Basin contrast sharply with those projected for the San Joaquin Valley Air Basin. During the next 15 years it is anticipated there would be no more than 10 exploration & development wells with as many as three wells resulting in new production. The remaining seven wells would be abandoned along with five or more existing wells. There are two oil fields within the basin that contain federal leases. The San Ardo field has 40 acres of federal lands while the Vallecitos field has 8,000 acres under federal lease. There are however only five producing wells on federal leases in the San Ardo field and only 13 producing wells on federal leases in the Vallecitos field. In the San Ardo field well abandonments are expected to exceed new developments under the most optimistic scenario (Milliken 1990c). In the Vallecitos field no new development is anticipated with several existing wells being abandoned. There is a less than 5% possibility that an exploration well could result in discovery of a small new oil field consisting of as many as 16 new wells (Milliken 1990d).

The net product, under the most optimistic development scenario, would be 10 new exploration or development wells and a net gain of seven producing wells on public lands. Since no data is available on specific emissions related to exploratory wells within the North

Central Coast Air Basin, average emission figures for diesel drilling operations in California have been used. These figures indicate the average oil or gas well drilling operation in 1979 resulted in emissions of 720 lbs of nitrogen oxides, 30 lbs of ROGs, and 55 lbs of particulates (Dennison, et al 1983). The ten new wells would result in average annual emissions over the 15 year life of the plan of 480 lbs of nitrogen oxides, 20 pounds of ROGs, and 35 lbs of particulates.

The net gain of seven producing oil wells and supporting tank farms would result in increased emissions of ROGs and nitrogen oxides. The 1979 KVB, Inc. analysis indicated the average oil well in the San Ardo field produced 1,991 lbs of ROGs, 4,360 lbs of nitrogen oxides, and 2,077 lbs of particulates (Dennison, et al 1983). The net gain of seven producing wells could be expected to increase emissions by 13,937 lbs of ROGs, 30,520 lbs of nitrogen oxides, and 14,594 lbs of particulates. Industry representatives indicate these figures may be a high estimate for nitrogen oxide emissions since most nitrogen oxide emissions in the San Ardo oil fields are from steam generator combustion sources associated with thermal enhanced oil recovery operations.

By 2005 the net annual increased emissions from federal leases would be 21,795 lbs of nitrogen oxides, 8,945 lbs of ROGs, and 10,185 lbs of particulates. The Monterey Bay Unified Air Pollution Control District has indicated that these forecast emissions are consistent with the District's 1991 Air Quality Management Plan (see comment letter 2.4 in Chapter 5).

An additional specific concern with air pollution in this basin are potential impacts to areas the California Air Resources Board has designated as Class I air quality management areas. The two Class I areas are the Ventana Wilderness and Pinnacles National Monument. Emissions from exploratory wells on adjacent or nearby BLM lands could cause temporary impacts to air quality in these areas by increasing the emissions of ozone generating compounds and particulates. The discovery of a new oil or gas field could result in long-term degradation of air quality through the life of the oil field. The generation of particulates is of particular concern since particulate concentrations are a major factor affecting visibility.

A comparison of predominant wind patterns and BLM lands where O&G exploration could occur indicates very little chance activities on BLM lands would affect air quality in the Ventana Wilderness (USDA 1983). BLM lands with moderate oil & gas potential, however are immediately adjacent to the eastern boundary of the Pinnacles National Monument. Any O&G exploration or development in this area could have a negative impact on air quality in the monument. Air monitoring in the monument already indicates that ozone levels exceed federal standards. The Monterey Bay Unified Air Pollution Control District is currently

conducting atmospheric modeling studies to determine the source of ozone precursor pollutants that are affecting the monument (MBUAPCD 1989).

No air modelling of emission data has been attempted in conjunction with this evaluation since the specific physical location of the projected emissions is hypothetical, and the regional air pollution control board is currently conducting a study to model the generation and movement of ozone which is the primary pollutant of concern.

Cumulative Impacts

The trends described above for the Vallecitos and San Ardo fields are expected to apply equally to private lands. Overall, abandonments of existing wells are expected to exceed new development wells by 150 to 750 wells by year 2005 (Milliken 1990c). These projections are based on declining oil reserves in the existing fields. They represent a 10% to more than 50% reduction in the number of producing wells in these oil fields. During this same period (1990-2005) the regional Air Quality Management Plan anticipates reductions in emissions associated with oil & gas production of 33% for ROGs, 54% for nitrogen oxides, and 59% for particulates (MBUAPCD 1989).

The regional Air Quality Management Plan projects that the North Central Coast Basin will be able to maintain federal standards for all pollutants by 1997 (MBUAPCD 1991).

Mitigation

All mitigation measures described for the San Joaquin Valley Air Basin would also be appropriate for this basin. Both the Vallecitos and San Ardo oil fields are currently serviced by electric power lines. Declining production in these fields and their limited life span, however could foster economic conditions making conversion of facilities to electric power uneconomical.

Air modelling studies could be required before any emissions were allowed on leases potentially impacting the Pinnacles National Monument. If the studies indicated that the air quality of the monument would be impacted, then use of electric power or other non-polluting technology could be required to minimize air quality impacts on the monument. This requirement would duplicate existing regulatory requirements. Monterey Bay Unified Air Pollution Control District Rule 207 (Review of New or Modified Sources) already requires air modelling if there is a potential for emissions to degrade air quality in Pinnacles National Monument or other Class I areas. If studies indicate there would be a deterioration in air quality, then reductions in emissions are required.

VEGETATION

PROJECTED IMPACTS WITHIN EXISTING OIL FIELDS

Six hundred acres of public lands available to oil and gas leasing are projected to be severely disturbed by such activities as oil well site and tank construction. Though 150 of these acres are expected to be quickly reclaimed, the initial severe surface disturbance is likely to remove most, if not all, perennial (long-lived) plants and would have a significant adverse impact on most populations of native annuals (short-lived species) on the entire 600 acres. Severe surface disturbance usually results in the invasion of introduced weedy species such as tumbleweed (Salsola iberica) and sandbur ragweed (Ambrosia acanthocarpa). Introduced species such as these can prevent native species from getting reestablished on disturbed sites and can also aggressively spread to adjacent undisturbed areas displacing additional native plant populations. Disturbed areas can also fragment native plant populations into smaller population areas which would be less able to recover from unpredictable natural events such as floods, fire, or disease. Once populations are fragmented they are also less resilient to impacts from heavy grazing or off-road vehicle use.

Approximately 500 of the 600 acres discussed above are expected to be within the Coalinga, East Coalinga, and San Ardo Oil Fields. The most common vegetation in these oil fields is annual grassland. Plant communities of special concern such as oak woodland, wetlands, sand dune communities, and perennial grasslands are not expected to occur within these fields. Pockets of saltbush scrub and ephemeral drainages, which are better able to support saltbush than adjacent uplands due to higher soil moisture, have been heavily impacted by oil and gas development in these fields in the past. Vegetation resources of concern such as saltbush scrub, which remain in these oil fields, merit special protective measures (see mitigation below).

Also within existing oil fields an additional 140 acres is projected to be impacted by relatively light surface disturbance resulting from seismic exploration. Seismic exploration can directly impact native vegetation by crushing plants. Seismic exploration can also indirectly impact native vegetation by disturbing the surface enough to encourage the growth of weedy species which compete with the native plant species and by compacting the soil which reduces soil oxygen and water available to plants and which may damage seeds stored in the soil.

PROJECTED IMPACTS OUTSIDE EXISTING OIL FIELDS AND WITHIN AREAS OF HIGH OR MODERATE OIL AND GAS POTENTIAL

Sixteen acres of public lands are projected to undergo severe surface disturbance resulting from oil and gas construction activities and there is a less than 5% chance 55 additional public acres will be so disturbed.

An additional 180 acres is projected to be impacted by relatively light surface disturbance resulting from seismic exploration.

Impacts to native vegetation due to oil and gas related activities outside existing oil fields are similar to those expected to occur within oil fields as discussed in the previous section. Additional vegetation concerns outside existing oil fields involve the possibility of impacts to oak woodland, wetlands, riparian areas, sand dune communities, and perennial grasslands. Proper mitigation (see mitigation section below) in most cases will serve to avoid impacts to these plant communities.

Cumulative Impacts

The extensive impacts which have occurred in habitats of special concern such as oak-woodlands are discussed in the Affected Environment chapter. These impacts are expected to continue on private lands and therefore any remaining pockets of these habitats on public lands will become even more important in the future. A total of 1,000 acres of public lands in the Hollister Resource Area are projected to be affected by oil and gas operations(see Total Affected Acres in Table 9) prior to the year 2006. The portion of this 1,000 acre total which actually contains any one of the several specialized habitats of concern will be something far less than 1,000 acres. This low amount of acreage in addition to the fact that most projected activity is expected to occur within existing oil fields where little of these habitats remain, limits the chances for overlap between future areas of oil and gas development and the location of these habitats which merit protective management. Where overlap does occur mitigation measures described below should avoid or minimize potential impacts to these habitats.

Mitigation Measures

When losses occur to specialized habitats because they can not be avoided then replacement/enhancement or compensation for permanent loss of habitat and reclamation of temporary habitat impacts would be required to preclude any net loss of specialized habitats.

Prior to any topsoil removal topsoil would be removed, stockpiled, and protected from erosion for use in future reclamation. This includes the removal of topsoil before the establishment of sumps or other oil and gas related facilities.

Upon termination of operations for any given area stockpiled topsoil would be distributed evenly over the disturbed area.

Reclamation needs, as determined by BLM, could include harvesting of on-site seed sources and the revegetation of these habitats until they are once again self-sustaining.

THREATENED, ENDANGERED AND OTHER SPECIAL STATUS PLANT SPECIES

The special status species in Tables 3 and 4, with the exception of the Carmel Valley bushmallow, are all annual forbs which may lie dormant during dry years. Adequate surveys to identify existing populations can often be conducted only during the short blooming season in years when moisture conditions are conducive for germination and flowering. During prolonged drought the start up of new surface disturbing oil and gas operations may need to be delayed up to several years in order to ensure that special status plant species do not exist on site or will not be severely impacted or eliminated by the operations. However, all of the existing oil and gas leases within the Hollister Resource Area were issued before any local plant species were listed by the U.S. Fish and Wildlife Service as endangered or threatened. Therefore these leases only include standard terms and conditions which may not be sufficient to delay startup of oil and gas operations long enough to ensure that special status plant populations are not adversely impacted. Therefore, impacts to special status plants may occur on lands already leased. Under this alternative new leases would not include stipulations that allow for delays in oil and gas related operations, therefore populations on these new leases could also be threatened. Since the Draft EIS was published the BLM has conducted additional T&E plant inventories and has increased our knowledge of habitat requirements. These actions have greatly reduced the potential for unknown populations of T&E species to be impacted by continuing oil field operations.

Oil and gas operations could affect special status plants directly by crushing or uprooting them with vehicles or exposing them to spillage or exhaust of toxic substances. Oil and gas operations can indirectly adversely impact special status plants by destroying the soil matrix during construction activities (which reduces available soil oxygen and water), contaminating the soil with oil products, aiding the establishment or spreading of competing weed species, and by clogging their reproductive parts with dust generated by vehicles or construction.

CALIFORNIA JEWELFLOWER - CAULANTHUS CALIFORNICUS

Five hundred of the 600 public acres projected to be severely disturbed by oil and gas operations are in the Coalinga, East Coalinga, and San Ardo Oil Fields. There are no historical C. californicus populations in these fields and results from recent field inventories indicate there is only a remote possibility for C. californicus to currently exist in these fields. Therefore, it is unlikely that this species will be impacted in these areas by future oil and gas operations.

The remaining 100 acres of projected surface disturbance within existing oil fields could impact unknown populations of the California jewelflower and potential habitat for it depending on the location of disturbance. The projected 140 acres of disturbance resulting

from seismic exploration at unknown locations within existing oil fields could also impact this species. These impacts have the highest potential to occur in three areas. Five historical populations of the jewelflower are known within a few miles of the Jacalitos Oil Fields. Also, suitable habitat for this species remains on public lands in the Jacalitos Hills within two miles of the recently discovered Kreyenhagen Hills' populations of C. californicus. There is a moderate chance for the California jewelflower to occur in the Kettleman Hills thus any future disturbances in the Kettleman North Dome Oil Field could also impact this species.

In areas of high or moderate oil and gas potential outside existing oil fields 16 acres are projected to be severely disturbed by oil and gas operations. There is a less than 5% chance an additional 55 acres will also be so disturbed. Relatively light disturbance is expected to occur on 180 acres in these high potential areas due to seismic exploration. All of the projected disturbances mentioned in this paragraph could impact the California jewelflower depending on their location.

Cumulative Impacts

Most of the California jewelflower's prime and original habitat (the sandy floor of the San Joaquin Valley) has been irreversibly altered by conversion of lands to agricultural uses, urban development, and development of oil and gas fields. Other habitat areas have been degraded by the invasion of highly competitive introduced species. Livestock grazing may have an especially deleterious affect on the California jewelflower because it occurs (often intensively) on nearly all remaining potential habitat of the California jewelflower (both private and public) and because cattle appear to highly favor this species for forage. Continued demands on remaining habitat for urban and rural development is also expected to result in additional losses of suitable habitat and unknown populations of the California jewelflower.

Because these development pressures will be most intense on private lands, the long-term preservation of these species may be dependent on the maintenance and expansion of populations on federal, state, and other protected lands. Placed in this perspective, it is apparent that adverse impacts to populations of the California jewelflower and its habitat on public lands could jeopardize its survival. Because of the existing circumstances Federal and State resource agencies responsible for management of endangered and threatened species have adopted a policy of "no net loss" of habitat for threatened and endangered species' native to the San Joaquin Valley region.

Mitigation

Individuals holding oil & gas leases on parcels with known populations or habitat for this species should be notified that lengthy delays in processing permits may occur if botanical inventories are not completed during appropriate seasons. To avoid future conflicts between

"lease development rights" and compliance with the Endangered Species Act, individuals holding leases in habitat for these T&E species should be encouraged to provide the BLM with general guidance on where future operations are anticipated so that inventories can be scheduled during the next growing season when conditions are appropriate. This procedure has been implemented successfully during the past three years with the BLM using industry supplied information to complete inventories on specific areas where future development could occur.

Authorization for destruction of potential habitat should require acquisition of off-site habitat lands of comparable or better potential for supporting reintroduction of these species. Ownership of these off-site lands should be transferred to the BLM for use during future species reintroduction efforts.

Issuance of new O&G leases within known and potential habitat of T&E species should be deferred until comprehensive botanical inventories have been completed to determine the location and extent of populations.

Exploratory drilling operations on unoccupied potential habitat should be required to use self-contained units to eliminate the need to construct sumps and to minimize spillage of petroleum products.

Oil & gas operators should be advised not to disturb any new areas during reclamation activities associated with abandonment of facilities in the Jacalitos and Kettleman North Dome oil fields.

When losses occur to potential special status species habitat because they can not be avoided, then reclamation of that habitat should be required of the lessee.

Prior to any topsoil removal topsoil should be removed, stockpiled, and protected from erosion for use in future reclamation. This includes the removal of topsoil before the establishment of sumps or other oil and gas related facilities.

Upon termination of operations for any given area stockpiled topsoil should be distributed evenly over the disturbed area.

Reclamation needs, as determined by BLM, may include the purchase of native plant seed or seedlings and the revegetation of these habitats until they are once again self-sustaining.

SAN JOAQUIN WOOLLY-THREADS - LEMBERTIA CONGDONII

The San Joaquin woolly-threads is more likely than the California jewelflower to be impacted by future operations in existing oil fields. L. congdonii currently exists in the Jacalitos Hills and Kettleman North Dome Oil Fields, occasionally within a few hundred feet of on-going

operations(BLM-Hollister files). According to Taylor (1989), past observations suggest that L. congdonii has some ability to colonize sites which have had past soil disturbances, including on former grain fields and areas subjected to prior surface grading. Past observations also suggest however that nearby L. congdonii populations may be needed for this species to recolonize formerly disturbed sites. The current and historical range of L. congdonii includes the western foothills of the San Joaquin Valley as far north as Panoche Creek whereas the California jewelflower is currently known only as far north as the Kreyenhagen Hills.

The above facts suggest that the entire 1,000 acres of public lands projected for oil and gas activities (except those in the San Ardo and outer coastal ranges) have some potential to impact the San Joaquin woolly-threads. Areas within the Hollister Resource Area in which this species could be most affected by oil and gas operations would be those areas currently occupied, especially the Jacalitos Hills and the Kettleman Hills, both of which have several L. congdonii populations.

Cumulative Impacts

The cumulative impacts to the San Joaquin Woolly-threads are very similar to those discussed above for the California jewelflower. Livestock grazing however, probably has less of an impact on the San Joaquin woolly-threads than the California jewelflower since livestock do not seem to prefer the San Joaquin woolly-threads over other species. On a couple of occasions both cattle and sheep have been observed avoiding L. congdonii as a forage species. However it is not known how livestock may adversely or beneficially impact this species in other ways such as by trampling of L. congdonii individuals or reducing competition to L. congdonii by foraging on grasses and other annuals. There are also many more populations of the San Joaquin woolly-threads than of the California jewelflower on public lands. For these reasons the cumulative impacts to the San Joaquin woolly-threads appear to be less than those projected for the California jewelflower.

Mitigation

Refer to the mitigation listed above for the California jewelflower.

HOOVER'S WOOLLYSTAR - ERIASTRUM HOOVERI

Like the San Joaquin woolly-threads, Hoover's woollystar currently grows within the Kettleman North Dome and Jacalitos Hills Oil Fields . The two species share similar ranges and habitats (at least in one location they are found growing alongside one another). Like the San Joaquin woolly-threads, Hoover's woollystar has also been observed growing on formerly disturbed sites. Because of these similarities, impacts from future oil and gas

operations on Hoover's woollystar are projected to be the same as those discussed above for the San Joaquin woolly-threads.

As discussed in Chapter Three there are only two known populations of E. hooveri on public lands within the Hollister Resource Area (though there are several populations of woolly-stars that have not yet been confirmed to be Hoover's woolly-star) and one of those occurs within the Jacalitos Hills Oil Field. Being one of the more northerly populations of Hoover's woolly-star this population could be of additional significance as it may contain genotypes (genetic strains) not found in the southern portion of its range.

Cumulative Impacts

Impacts to Hoover's woolly-star are expected to be similar as those discussed above for the San Joaquin woolly-threads. However, because there are many more populations of Hoover's woolly-star than the San Joaquin woolly-threads on private and public lands throughout the range of these species', impacts to Eriastrum hooveri from oil and gas operations will probably be less significant than impacts to Lembertia congdonii.

Mitigation

Refer to the mitigation listed above for the California jewelflower.

OTHER SPECIAL STATUS PLANT SPECIES

Four of the five remaining special status species likely to be impacted under Alternative A are federal candidate 2 (C2) species (see footnote to Appendix D for explanation of the C2 category). These species are addressed below.

The Carmel Valley bushmallow (Malacothamnus palmeri ssp. palmeri) and the one-awned spineflower (Chorizanthe rectispina) occur in chaparral and may be impacted by oil and gas operations in the San Ardo area.

The forked-fiddleneck (Amsinckia furcata) is usually found in very restricted habitats and these areas may be impacted by future oil and gas development, especially in the Coalinga and East Coalinga Oil Fields.

Hollisteria (Hollisteria lanata) is found in similar habitats as the three threatened and endangered species discussed above, (Caulanthus californicus, Lembertia congdonii, and Eriastrum hooveri). Hollisteria also occurs in additional habitats which do not support these listed species (such as gravelly roadsides). Thus, impacts to hollisteria from oil and gas development are expected to be similar to impacts on the listed species above within their

habitats. However these impacts are not expected to be as significant to hollisteria because hollisteria does occur in a wider diversity of available habitats.

Panoche peppergrass, which has no official special status designation merits similar protection to that afforded special status plants discussed above. This species could be affected by oil and gas development, especially near Vallecitos Valley which is the only moderate to high oil and gas potential area known to support Panoche peppergrass.

Mitigation

Measures listed in Chapter Two to protect special status plant species are expected to be sufficient to minimize oil and gas related impacts to Panoche peppergrass and the above four Candidate 2 species.

SPECIAL STATUS PLANT SPECIES WITH MODERATE POTENTIAL TO BE IMPACTED BY OIL AND GAS DEVELOPMENT (see Table 4)

The limited data on the distribution, ecology, and biology of the three plant species listed in Table 4 is insufficient to make a conclusive assessment of potential impacts to these species from future oil and gas development. However, protective measures listed in Chapter Two are expected to be sufficient to minimize impacts to these species.

WILDLIFE

Continued development in the oil fields would result in the destruction of about 450 acres of wildlife habitat and a temporary disturbance of an additional 150 acres of habitat. Most of this disturbance would be in annual grasslands where the predominant vegetation is non-native annual grasses. Much of this area has already been disturbed by existing oil & gas development activities and many species that are not able to coexist with oil & gas development have probably already been eliminated from the area. Potential impacts to threatened or endangered species found in these areas is discussed under a separate heading in this chapter.

In addition to eliminating wildlife habitat, development of new wells in the oil fields would also result in the construction of new oil or water disposal sumps which historically have been a hazard to birds and small mammals. Current BLM procedures, however, require that all sumps and tanks are covered with screens to prevent entry by birds or small mammals (CWRCB 1975).

Disturbance resulting from unsuccessful wildcat exploration wells outside the developed fields would result in the temporary displacement of wildlife on as many as 120 acres of habitat. Most of this activity would probably occur in annual grasslands where the major focus is on threatened or endangered species habitat. Upland game birds could be affected if pockets of saltbush which provide cover are destroyed. Standard mitigation however is expected to preclude the destruction of these specialized habitats. Some wildcat wells could also be drilled in chaparral habitats. Deer populations and other wildlife species in these areas are currently limited by the lack of water and the prevalence of over-mature brush stands. If exploration wells are located in open areas or juvenile brush fields near water sources, then deer and other wildlife could be denied these critical habitats. Impacts would be most severe during drought years or the fawning season. The drilling of unsuccessful exploration wells located in over-mature brush fields away from existing water sources could benefit deer and other wildlife by creating new open grassland or juvenile brush habitats. However the term of benefit would depend on seasonal rates of dense brush reestablishment (three to five years). These new habitats would be particularly valuable if reclamation resulted in the establishment of native perennial grasses that would maintain the open areas for longer periods of time.

Substantial benefits could occur to numerous wildlife species if an unsuccessful wildcat well resulted in the discovery of usable water which could be developed as a source of water for wildlife. Wells located on hills or other prominent elevations could have the potential to provide new water sources for wildlife in several thousand acres of habitat. These same new water sources, however, could be detrimental to wildlife populations if they result in expanded domestic livestock grazing and increased competition between livestock and wildlife.

If a wildcat exploration well is successful and a new oil field is discovered, then there could be a permanent loss of an additional 55 acres of wildlife habitat. If the discovery is in annual grassland habitat areas, the disturbance could preclude the use of some areas by upland gamebirds. Habitat for several threatened or endangered species could also be affected and are discussed in a separate section of this chapter. If the new oil field was discovered in the Williams Hill area, then there could be a permanent loss of 55 acres of habitat of the Santa Lucia deer herd.

Geophysical exploration activity would only have a minor impact on wildlife species which would be limited to displacement of species from some habitat areas for one to ten days.

Cumulative Impacts

Cumulative impacts to species adapted to annual grasslands, which includes most of the developed oil fields, are discussed in the Threatened, Endangered and Other Special Status Animal Species section of this chapter. Habitats on public lands are expected to have continued impacts from livestock grazing and increases in recreation use. Estimates are that

at current levels of development most annual grassland/shrub habitats in the San Joaquin Valley will be destroyed by 1996 (USFWS 1985).

The only other action affecting chaparral habitats on public lands is the BLM's prescribed fire program. Controlled fires are being set in chaparral habitats, including Williams Hill, to reduce fire danger and improve wildlife habitat. Controlled fires are also being used on private lands to reduce fire danger and to improve livestock grazing conditions. Many local livestock ranches have diversified and are now becoming dependent on revenues from hunting of game animals, including guide services and charging hunters for access to wildlife habitats. This trend is expected to provide an economic incentive for protection and enhancement of wildlife habitats on private lands.

Mitigation Measures

Conduct inventory of all federal lease operations to assure that all sumps and tanks are covered with screening.

Where the location of exploratory wells indicates they could be developed as a needed source of new wildlife waters, require that operators provide the BLM an option to develop unsuccessful wells for wildlife enhancement purposes. Protect new water sources from livestock, except when better livestock distribution would enhance more critical wildlife habitat in other portions of the grazing allotment.

For mitigation specific to annual grasslands, see measures under the threatened and endangered species portion of this chapter.

The following mitigation measures apply to chaparral habitats:

Require that exploratory wells be moved at least 200 meters from water sources, and encourage placement on dense chaparral sites rather than existing grassland or juvenile brush sites.

Require reseeding with native perennial grass species wherever feasible.

If a new oil field is discovered, require off-site mitigation for the loss of wildlife habitat. Suggested off-site mitigation would be to provide funding for controlled burns to create new habitat in existing over-mature brush fields.

Consider closure of new roads to reduce the risk of illegal harvest.

THREATENED, ENDANGERED AND OTHER SPECIAL STATUS ANIMAL SPECIES

SAN JOAQUIN KIT FOX

There could be a long-term loss of up to 505 acres of habitat and temporary disturbance of up to 490 acres of habitat. It is anticipated that there would be direct mortality to some individuals from vehicle traffic and spills of contaminated waste waters or petroleum products. There should be no impact from collapsed burrows since mitigation in the existing ACEC plan would prohibit any surface occupancy in a 200' buffer zone around all active or inactive dens. However, kit foxes may be adversely impacted by the movement and removal of oil field pipe that provides den sites for many foxes inhabiting oil fields. Additional, artificial feeding and foraging of trash may reduce kit fox health and vigor through poor nutrition. Feral and domestic dogs have also been documented to cause kit fox mortality.

Most of the impacts would occur from loss of hunting habitat in the existing oil fields. Kit fox currently occurs in low numbers within the existing oil fields where much of the habitat has already been degraded. Kato and O'Farrell (1985) found that a project in areas where 50-60% of the habitat had already been disturbed would have a greater impact on the species than a comparable project in undisturbed habitat. Other studies have indicated that areas of moderate oil development have a good potential to support kit fox as long as suitable mitigation policies are observed (O'Farrell et. al., 1980, 1984). The existing low numbers of kit fox in the oil fields may be the result of a combination of marginal natural habitat combined with a long-term historic disturbance by oil industry activity. Because the existing populations numbers are at low levels, any additional disturbance of occupied habitat in these areas and incidental mortality of individuals could jeopardize these remaining populations.

Activities outside the existing oil fields would be limited to temporary disturbance resulting from exploration activities, and a less than 5% possibility that there would be long-term disturbance of up to 55 acres from the development of a small oil & gas field. While these activities would result in the loss of habitat and could result in prey loss and in mortality to some individuals, the studies cited above would indicate that with appropriate measures the populations would not be jeopardized. Further supporting this conclusion are additional studies by O'Farrell (1984) of recent oil activity in the Elk Hills National Petroleum Reserve. These studies documented kit fox density, reproduction, dispersal, and mortality were similar in developed and undeveloped areas of the reserve.

Cumulative Impacts

The major other activities that occur in kit fox habitat on public lands are livestock grazing and recreation. Light to moderate livestock grazing is thought to be compatible with kit fox, however the indirect and long-term effects of grazing on kit fox are not well understood. Heavy intensity grazing is adverse to maintaining kit fox habitat. Most recreation use in kit fox habitat is hunting of upland game and off-highway-vehicle (OHV) driving. While

vehicles are limited to designated roads within kit fox habitat, trespass vehicle use in closed areas is a continuing problem. The demand for recreation use of public lands in this region is expected to continue to grow in response to increased urban population pressures, and limited opportunities on private lands for outdoor recreation. Increased recreation use resulting from the development of new access routes into kit fox habitat in conjunction with oil & gas activity could result in additional disruption of habitat and mortality of individuals.

Ninety-three percent of the natural habitat of this species has already been destroyed primarily by conversion to agricultural lands and urban/rural development. As the population of California increases, continued demands for more lands for development and for recreation are expected to result in the loss of additional habitat areas on private lands. The U.S. Fish & Wildlife Service has estimated that at current rates of development, all San Joaquin Valley habitat on private lands would be destroyed by 1996 (USFWS 1985). Because of these trends, the Federal and State wildlife agencies responsible for management of endangered species have adopted a policy of "no net loss" of habitat for T&E species native to the San Joaquin Valley.

Mitigation

All mitigation measures in the Panoche/Coalinga Area of Critical Environmental Concern (ACEC) Plan (see Appendix C) should be vigorously enforced.

Wherever possible, all vehicle use should be restricted to existing roads in occupied kit fox habitat. New roads should be limited to the minimum necessary in both potential and existing habitat, with unneeded roads closed to public use and reclaimed.

Development of new oil & gas fields should be limited to disturbance of 10% of the T&E habitat area within a lease.

Exploratory drilling in T&E habitat should be required to use self-contained units to eliminate the need to construct sumps and to minimize spillage of petroleum products.

Authorization for destruction of occupied habitat within the developed oil fields should require acquisition of off-site habitats supporting comparable populations or funding to accommodate future purchase of habitat when suitable lands are available. Ownership of these off-site lands should be transferred to the BLM for dedication to endangered species habitat management.

Rehabilitation of abandoned well sites could be used in lieu of acquisition of off-site mitigation lands, but only if studies of vegetative characteristics and prey species distribution indicate kit fox habitat has been restored.

Site-specific conditions for well abandonment operations within kit fox habitat should give priority to maintaining and/or establishing habitat for this species. Artificial denning structures should be used when abandonments are adjacent to occupied habitat areas.

Inventories should be conducted in the existing fields and in any areas of new development to verify the severity of impacts to kit fox populations from incremental development. Appropriate inventory procedures should be developed with the California Department of Fish & Game.

There should be careful survey of pipes prior to removal or movement to assure they are not being used by kit fox.

Trash should be contained in adequate facilities to assure no scavaging by kit fox.

Vehicle speed limits should be set low to reduce the probability of mortality from vehicle traffic.

Free roaming dogs should not be permitted.

BLUNT NOSED LEOPARD LIZARD

There could be a long-term loss of up to 505 acres of habitat and temporary disturbance of up to 490 acres of habitat. It is anticipated that there would be direct mortality to some individuals from vehicle traffic, collapsed burrows resulting in suffocation, and spills of contaminated waste waters or petroleum products.

Most of the impacts would occur in the existing oil fields. While studies by Chesemore (1979) and O'Farrell & Kato (1980) indicate that this species is compatible with certain intensities of oil development, it is not clear how much development can occur before loss of populations would occur. Chesemore indicated that heavy development in the oil fields would ultimately result in the loss of the species. Increased development in the Coalinga fields could result in some loss of populations. The potential for loss of populations could be offset by colonization of properly rehabilitated abandoned areas by new individuals. This species has been observed in abandoned production areas undergoing natural revegetation.

Exploration and development activities outside the developed oil fields are not expected to threaten existing populations. However, loss of individuals from entrapment in burrows, vehicle strikes, and contaminants are possible. Additional studies by Kato & O'Farrell (1985) also indicate that low intensity activities have a benign impact on the species. Existing ACEC guidelines would prohibit surface occupancy within 100' of dry washes in blunt-nosed leopard lizard habitat.

Cumulative Impacts

Because blunt-nosed leopard lizards occupy comparable habitats and are subject to similar threats, cumulative impacts are the same as previously discussed for the San Joaquin kit fox.

Mitigation

Most mitigation measures discussed for the San Joaquin kit fox would also be appropriate for blunt-nosed leopard lizard habitat. The construction of artificial burrows, however, would not be necessary for blunt-nosed leopard lizard habitats.

Within blunt-nosed leopard lizard habitat, construction should be scheduled during periods of the year when the lizards are active and temperatures are between 75 and 105 degrees Fahrenheit.

Road berms should be avoided during road maintenance and construction with burrows hand excavated to allow animals to escape prior to destruction of the berms.

GIANT KANGAROO RAT

Prime habitat for this species does not occur in the developed oil fields. Continued development of the oil fields is not expected to affect giant kangaroo rat.

This species could be affected by the potential long-term disturbance of 55 acres from the development of a new oil & gas field, and temporary disturbance of up to 195 acres from exploration activities. Existing ACEC guidelines would require that a minimum buffer zone of 200' be maintained around all giant kangaroo rat colonies. Some direct mortality of giant kangaroo rats could still occur from vehicle traffic. These impacts are not expected to affect the overall populations if ACEC restrictions are rigidly followed. Indirect impacts could also occur from increased recreational vehicle traffic and camping if oil & gas development creates new vehicle access routes into habitat areas.

Cumulative Impacts

Habitat areas on federal lands are impacted by livestock grazing and recreation use. Studies by Williams (1989) indicated that livestock grazing did not appear to have a noticeable impact on giant kangaroo rat population density. Damage however has been documented in the Panoche area from sheep bedding on giant kangaroo rat colonies. Increased recreation use could result in localized damage to colonies from trespass off-road vehicle use and camping.

This species currently occupies less than three percent of its historic range. Five relatively small areas totalling 12 square miles remain that support population densities typical of those existing prior to 1950. Many of the remaining populations consist of only a few individuals widely separated from other populations. Because its habitat requirements are even more restricted than the kit fox or blunt-nosed leopard lizard, development pressures are even more likely to result in destruction of remaining habitat areas on private lands in the San Joaquin Valley.

Mitigation

Avoidance of giant kangaroo rat precincts and the 200 foot buffer should be adequate to protect these species. Most mitigation measures discussed for the San Joaquin kit fox would also be appropriate for giant kangaroo rat habitat. The construction of artificial burrows, however, would not be necessary for giant kangaroo rat habitats.

SAN JOAQUIN ANTELOPE SQUIRREL

The San Joaquin antelope squirrel generally occupies similar habitats as the blunt-nosed leopard lizard. Impacts would generally be similar to those described for the blunt-nosed leopard lizard. However, this species is more dependent on shrub cover and will often use burrows on the side of road cuts and berms.

Mitigation

Shrub cover at a light to moderate density should be included in the rehabilitation design.

Road berms should be avoided during road maintenance and construction with burrows hand excavated to allow animals to escape prior to destruction of the berms.

WATER QUALITY/EROSION

SURFACE WATER/EROSION

Construction of oil production facilities would create a long-term disturbance of soil and vegetation of up to 505 acres increasing the potential for soil erosion. Additional erosion could also occur on about 150 acres disturbed by unsuccessful exploration wells. Most of this activity is expected to occur in or adjacent to the Coalinga oil fields where slopes are generally less than 20% and the soil erosion potential is low or moderate.

Mitigation measures described in Chapter Two to protect water quality (page 17) are expected to minimize any impacts to water quality resulting from increased sedimentation or erosion. These measures, which apply to all alternatives, include use of the Surface Operating Standards for Oil and Gas Exploration and Development (RMRCC 1989), and requirements that detailed engineering studies be submitted with proposals for development on slopes that exceed 10%.

The Surface Operating Standards for Oil and Gas Exploration and Development guidelines were developed by a Forest Service/Bureau of Land Management interagency task force. The guidelines contain detailed engineering designs to assure that road construction, drainage crossings, drilling pad sites, and production facilities are all constructed with good engineering practices. Use of these procedures are expected to minimize any sedimentation or erosion on slopes below 10% where erosion hazards are generally considered low.

On slopes above 10%, requiring studies by certified engineers would assure that proposed roads and other developments were designed to preclude slope failure or off-site transport of sediments. Application of this requirement for any surface disturbance in the Moreno formation is expected to preclude any accelerated erosion of selenium-bearing sediments.

These procedures are consistent with Best Management Practices (BMPs) contained in the Central Coast Region Water Quality Control Plan (CSWRCB 1990) for protection of water quality during land disturbing activities, and are consistent with procedures established by local counties (Monterey County 1987; FCPC 1980).

SURFACE WATER/OIL SPILLS

It is anticipated that there would be one oil spill in the range of 5,000 to 20,000 barrels or more during the 15 year life of this plan (Milliken 1990c). A spill of this size in the Vallecitos oil field could have a serious long-term impact on water quality in the Silver Creek drainage making the water unusable or unhealthy for wildlife or livestock use. Protecting the quality of water in this drainage is important because it is a major water source for several endangered or threatened animal species.

Oil & gas operators are required to notify the BLM immediately whenever more than 100 barrels of oil are spilled in an incident. Containment dikes must be constructed around all storage facilities. These containment dikes must have sufficient volume to contain, at a minimum, the entire content of the largest tank in the facility.

FLOODPLAINS

Oil field exploration and development within floodplains could result in contamination of surface waters if petroleum sumps are flooded. Construction of facilities or modification of landforms could also divert floodwater resulting in impacts to adjacent properties.

BLM standard procedures require avoidance of floodplains wherever possible and require that all oil storage or waste facilities be located away from established drainage patterns. Despite this guidance oil field activity could result in some disturbance of floodplains since much the San Ardo oil field is within the Salinas River floodplain. Storage of oil tainted liquids in sumps or in oil well cellars could result in contamination of surface waters during flood events.

County zoning requirements currently prohibit construction of facilities that could impede the flow of floodwater or result in impacts to adjacent properties. Section 404 permits per the Clean Water Act would also be required before any fill or dredged materials were deposited on floodplains.

GROUNDWATER

No contamination of groundwater resources is expected to occur if standard operating procedures are followed. These standard operating procedures cover well casing requirements, subsurface disposal of wastes, use of pits for oil or produced water, spill contingency plans, and abandonment procedures.

BLM procedures require that surface casing be set 200 feet below the deepest fresh water aquifer that could reasonably be developed for use. The casing is a string of steel pipe which, when properly installed and cemented, protects aquifers from being contaminated by drilling and oil production operations.

Historically groundwater below many oil fields has been impacted by percolation of oil field wastewater from unlined sumps (EPA 1986). California code and BLM procedures now prohibit the use of unlined sumps where there is any potential to impact groundwater aquifers (SWRCB 1975; EPA 1986). Leak detection systems are required for all lined pits to assure the pits are functioning properly.

In addition to abiding by stringent federal procedures, operators of leases on federal lands are also required to get appropriate permits from the California Division of Oil & Gas (CDOG) before commencing drilling activities on federal leases. The CDOG also regulates the use of injection wells for oilfield waste water disposal. The Regional Water Quality Control Boards regulate any proposed discharge of oil field wastes on land (i.e. use of sumps). In 1988 a Memorandum of Agreement was signed by the California State Water Resources Control Board and the California Department of Conservation, Division of Oil & Gas (DOG)

to establish coordinated permit and review procedures to assure that oil & gas operations do not cause degradation of groundwater resources (CSWRCB 1990).

In the current Water Quality Control Plan for the Central Coast District, the Regional Water Quality Control Board concurred that existing procedures are satisfactory to protect groundwater resources from contamination by oil & gas exploration or development activities (CSWRCB 1989).

Cumulative Impacts

Regional Water Quality Control Plans (CSWRCB 1989 & CSWRCB 1990) have been developed by the regional water quality control boards to deal comprehensively with all potential sources of surface or groundwater contamination. The Bureau of Land Management, U. S. Forest Service, and CALTRANS have all signed agreements with the State Water Resources Board which designates these agencies as responsible for implementing Best Management Practices (BMPs) on lands under their jurisdiction (CSWRCB 1989). The implementation of these agreements, and the Regional Water Quality Control Plans, are expected to assure that the cumulative impacts of the numerous actions that could affect water quality do not result in unacceptable degradation of water quality.

Mitigation Measures

Conduct inspections of all federal leases in the Vallecitos oil field to assure that containment dikes are sufficient to prevent additional spills in Silver Creek. Review transportation plans and pipelines to see if additional mitigation measures may be appropriate to minimize the potential for a major spill into the Silver Creek drainage.

Conduct an inventory of sumps on federal lands to assure that all sumps located in natural drainages and floodplains have been removed.

Conduct an inventory of sumps on federal lands to assure that all sumps with potential to contaminate groundwater resources have been lined and are fitted with leak detection systems.

Within floodplains prohibit the construction of oil waste sumps or the storage of oil in oil well cellars.

Assure that development proposals within floodplains are in compliance with county floodplain zoning requirements and have acquired Section 404 Clean Water Act permits as appropriate.

Mitigation Measures

Existing Oil Fields

Develop comprehensive plans for abandonment of non-producing leases to assure that all contours are restored to natural appearances, all machinery and debris is removed, all contamination by hazardous materials is cleaned-up per State and Federal laws, and denuded areas are revegetated with natural appearing vegetation.

I-5 Corridor

Require that all access roads follow contours and be constructed on slopes that are not visible from the foreground or middleground viewshed of I-5.

Limit production facilities on leases to one pad per 40 acres encouraging the installation of multiple wells per pad. Encourage location of the pads in areas that are not visible from the foreground or middleground viewshed of I-5.

Require the use of low-profile production facilities and painting of all facilities to match natural landscape colors.

Williams Hill

Require that all access roads follow contours and avoid routes visible from major roads. Require complete rehabilitation of all road cuts.

Pinnacles Area

Require that access roads avoid Pinnacles viewshed whenever possible.

Require the use of low-profile production facilities and painting of all facilities to match natural landscape colors.

OIL AND GAS RESOURCES

Currently there is an established oil and gas industry in the resource area with producing oil and gas fields. Producing wells on federal leases account for only 2% of the producing wells

in the resource area. It is anticipated that the development of new oil wells would be partially offset by abandonment of existing wells. On federal lands a net increase of about 25 wells is expected during the next 15 years.

Exploration and development activity on federal leases within the producing fields is not expected to have a significant impact on local or regional economies. Drilling crews generally are based in Kern County. Most oil field maintenance crews are located in the Coalinga area. No major changes in drilling, production, or exploration activity rates are projected during the next 15 years (Milliken 1990c).

There is a less than 5% chance that a new oil or gas field could be discovered on public lands during the 15-year projected life of this plan. If a new field was discovered, it is anticipated that its reserves would be between 200,000 and 1,000,000 barrels (Milliken 1990c). This compares with current existing reserves within producing fields in the resource area which are estimated at 288,979,000 barrels (Milliken 1990c) and current California known reserves which are estimated at 5.9 billion barrels (CCCOP 1989).

Environmental constraints on oil & gas exploration are not expected to affect the level of exploratory drilling activity. The recent historical trends in exploratory drilling activity appears to be primarily responsive to changes in the price of oil (Milliken 1990c). Areas not available for oil & gas leasing under this alternative have no potential for the discovery of oil & gas resources (Milliken 1990a).

ALTERNATIVE "B" - NO LEASING

REASONABLY FORESEEABLE DEVELOPMENT SCENARIO

There would be no new leasing under this alternative. Oil & gas exploration and development activities on existing leases however would continue to occur until expiration or abandonment of the leases. Oil & gas exploration and development activities anticipated during the next 15 years under this alternative are summarized below and in Table 10:

Within Existing Developed Oil Fields

A) All federal lands within the developed oil fields are already under lease. These leases remain in effect as long as oil is being produced. The leases are not expected to expire during the 15 life of this plan. Development activities

in the oil fields are expected to be the same as described for the Current Management Alternative (Alternative "A").

Within Areas With High or Moderate Oil & Gas Potential

A) About 30% of this area is currently under lease. Unless economic quantities of oil or gas was discovered, most of these leases would expire within the next five to six years. The most probable scenario is that one or two unsuccessful wildcat wells would be drilled resulting in a temporary disturbance of two to five acres. These areas would be reclaimed following completion of the drilling activities.

B) There could also be additional temporary disturbance of about 40 acres from seismic explorations. These explorations can be authorized in areas that are not available for oil and gas leasing. It is anticipated that some seismic operations would continue to be conducted on federal lands since this information would be valuable in predicting the location of oil & gas fields on adjacent private lands.

C) Termination of oil & gas leasing on federal lands is not expected to affect the level of oil & gas exploration and development activities on private lands. These activities would occur as described for the Current Management Alternative (Alternative "A").

Within Areas With "No" Oil and Gas Potential

A) There would be no oil and gas exploration or development in these areas since they are not currently leased and would not be available for leasing.

TABLE #10
ALTERNATIVE "B"
SUMMATION OF AFFECTED ACRES

O&G POTENTIAL	EXPLORATION TEMPORARY IMPACTS			DEVELOPMENT LONG-TERM IMPACTS			ABANDONMENTS RECLAIMED ACRES			NET LONG-TERM DISTURBANCE		
	BLM	PVT	TOTAL	BLM	PVT	TOTAL	BLM	PVT	TOTAL	BLM	PVT	TOTAL
Existing Oil Fields	**290**	3,000	3,290	**450**	11,950	12,400	**320**	2,200	2,520	**130**	9,750	9,880
High/Moderate O&G Potential												
Most Likely Scenerio	**45**	385	430	0	630	630	0	0	0	0	630	630
Less Than 5% Probability (Additional Impacted Acres)				**0**						**0**		
No Potential												
Most Likely Scenario	0	0	0	0	0	0	0	0	0	0	0	0
Less Than 5% Probability	**0**											
TOTAL AFFECTED ACRES	**335**	3,385	3,720	**450**	12,580	13,030	**320**	2,200	2,520	**130**	10,380	10,510

AIR QUALITY

SAN JOAQUIN VALLEY AIR BASIN

Compared to the Current Management Alternative (Alternative "A"), there would be four fewer exploratory wells and 15 fewer producing wells within the San Joaquin Valley Air Basin. This assumes that a new oil & gas field would not be discovered before existing leases outside the developed oil fields expire. For analysis purposes, Alternative A assumed that a new field would be discovered even though the probability of discovery is less than 5%.

Following the same procedures outlined in the analysis for Alternative A would indicate that this alternative would result in increased annual emissions of 59,480 lbs of ROGs, 36,985 lbs of nitrogen oxides, and 10,332 lbs of particulates.

Cumulative impacts are the same as described under Alternative A. When viewed in concert with other anticipated emission sources, it is apparent emissions from federal oil & gas leases in the San Joaquin Valley Air Basin would contribute a negligible amount with overall air quality deteriorating and continued failure to meet federal standards for air quality within the basin. Mitigation described under Alternative A would also be appropriate for this alternative.

NORTH CENTRAL COAST AIR BASIN

Compared to the Current Management Alternative (Alternative "A"), there would be four fewer exploratory wells and 15 fewer producing wells within the North Central Coast Air Basin. This would result in a net reduction of eight producing wells on federal leases in the air basin.

Following the procedures used in the analysis for Alternative A would indicate that by year 2005, the net annual emissions from federal leases would result in a decline of 65,110 lbs of nitrogen oxides, 29,855 lbs of ROGs, and 31,140 lbs of particulates. In actuality, greater declines would probably be realized since these calculations assume that new wells would produce the same emissions as existing wells that were being abandoned.

It is unlikely there would be any impact to air quality in Pinnacles National Monument since adjacent lands are not currently under oil & gas lease, and under this alternative no new leases would be issued.

Cumulative impacts would be the same as described under Alternative A. Oil and gas operations on both federal and private lands would result in reduced emissions of ROGs, nitrogen oxides, and particulates. Mitigation measures would also be the same except that

measures to protect air quality at Pinnacles National Monument would probably not be necessary under this alternative.

VEGETATION

Impacts would be similar to those described under the Current Management Alternative (Alternative "A") except that total disturbed areas would be limited to 785 acres with all disturbed areas within the developed oil fields.

THREATENED, ENDANGERED AND OTHER SPECIAL STATUS PLANT SPECIES

Potential impacts within the existing oil fields would be the same as described under the Current Management Alternative (Alternative "A") since curtailing the leasing is not expected to affect these producing leases. There would be a high probability that adverse impacts could occur to T&E listed species and Category 2 species if there is any new surface disturbance in the Jacalitos and North Kettleman Dome oil fields prior to comprehensive botanical inventories.

It is very unlikely there would be any impact to T&E plant species in areas outside the producing fields. The only potential impact would be from operations that could occur on existing leases before the leases expire. Most existing leases would expire during the next five to six years and under this alternative would not be renewed.

Cumulative impacts would be the same as described under Alternative A, with any loss of T&E populations potentially threatening the long-term survival of the affected species. Mitigation measures for actions within the developed oil fields described under Alternative A would also still be appropriate under this alternative.

WILDLIFE

There would be no impact to wildlife under this alternative since most activity would occur in the developed oil fields where wildlife values have already been compromised by oil & gas development activities.

THREATENED, ENDANGERED AND OTHER SPECIAL STATUS ANIMAL SPECIES

Potential impacts within the existing oil fields would be the same as described under the Current Management Alternative (Alternative "A") since curtailing the leasing is not expected to affect these producing leases. Continued development of the Coalinga oil fields could jeopardize remnant populations of San Joaquin kit fox and blunt-nosed leopard lizard.

It is very unlikely there would be any impact to T&E animal species in areas outside the producing fields. The only potential impact would be from operations that could occur on existing leases before the leases expire. Most existing leases would expire during the next five to six years and under this alternative would not be renewed.

Cumulative impacts would be the same as described under the Current Management Alternative (Alternative "A"), with most San Joaquin Valley habitats on private land potentially lost by 1996 given current rates of development. Mitigation measures for actions within the developed oil fields described under the Current Management Alternative (Alternative "A") would also still be appropriate under this alternative.

WATER QUALITY/EROSION

SURFACE WATER/EROSION

There would be a slight, but probably indiscernible difference in impacts when compared to the Current Management Alternative (Alternative "A"). There could be a slight difference in surface erosion since about 60 to 65 fewer acres would be disturbed by construction activities under this alternative. Some increased erosion could occur but would be minimal since mitigation would require procedures consistent with regional Best Management Practices (BMPs).

SURFACE WATER/OIL SPILLS

Impacts would be the same as in the Current Management Alternative (Alternative "A") since the greatest danger of oil spills would be in the existing developed oil fields. There would be a potential for contamination of the Silver Creek drainage if a major spill occurred in the Vallecitos field.

FLOODPLAINS

Impacts would be the same as in the Current Management Alternative (Alternative "A") since the greatest potential for impacts would be in the San Ardo oil field where all federal land is already under O&G lease. There would be a potential for contamination of surface waters during flood events in the San Ardo field if oil tainted liquids are being stored in sumps or oil well cellars within floodplain areas.

GROUNDWATER

There would be no impact to groundwater quality. See the discussion under the Current Management Alternative (Alternative "A").

As per the discussion under the Current Management Alternative, there are no anticipated cumulative impacts. Mitigation measures as described under the Current Management Alternative would all be appropriate since all apply to operations in the existing oil fields.

VISUAL RESOURCES

Under this alternative there would be no new O&G leases on BLM managed federal lands in the Hollister Resource Area.

Impacts in the developed oil fields would be the same as in the Current Management Alternative (Alternative "A") since the oil fields are already under lease and would not be affected by elimination of new leasing. There would be no degradation of existing scenic values and improvement in some oil fields with abandonment procedures resulting in the removal of unsightly decrepid oil facilities.

Most potential impacts anticipated outside the developed oil fields probably would not occur since only portions of these lands are currently under lease and these leases should expire within the next five to six years. For the remainder of the life of the plan there would be no impacts to these areas.

I-5 Corridor - Some impacts could still occur in the I-5 corridor, however it is not very likely since few federal lands are currently under lease and these leases would expire within the next five to six years.

Pinnacles Area - There would be no impact to the Pinnacles National Monument viewshed since these areas are currently not under lease and new leases would not be issued under this alternative.

Williams Hill - Some impacts could still occur on Williams Hill since most of this area is currently under lease. These leases would expire in the next five to six years.

Cumulative impacts would be similar to the Current Management Alternative (Alternative "A"). Abandonments on private leases as well as federal leases in the Kettleman North Dome and Jacalitos fields could result in improvement of scenic quality in these areas. No cumulative impacts are identified for the I-5 corridor, Pinnacles area, or Williams Hill since under this alternative it is unlikely any impacts would occur to the federal lands.

Mitigation measures identified for the developed oil fields under the Current Management Alternative (Alternative "A") would also be appropriate under this alternative.

OIL AND GAS RESOURCES

Exploration and development activities within the producing fields would continue unabated since public lands in the fields are already leased for oil & gas exploration and development.

Opportunities for discovery of a new oil & gas field on federal lands would be severely compromised since new areas would not be available for lease. Areas currently under lease which do not have producing wells would also not be available for oil & gas exploration after the existing leases expired.

This would eliminate the potential for discovery of between 200,000 and 1,000,000 barrels of oil or gas (Milliken 1990c). This represents only 0.003% and 0.017% respectively of the known California reserves of 5.9 billion barrels. The failure to discover these reserves of 200,000 to 1,000,000 barrels on public lands would have no discernable impact on the ability of California or the United States to be self-sufficient in the production of oil or gas resources.

Cumulative Impacts

Studies completed by the National Academy of Sciences in 1979 indicated that continued withdrawal of lands from oil & gas exploration is one of several factors affecting future U.S. oil & gas production. Other factors affecting production were price controls on domestic oil & gas, and permitting processes for off-shore activities. This scenario has been modified by the oil glut of the 1980s which has depressed prices due to over supply and decreased demand. The oil glut has been projected to last under current conditions until the end of the 1990s.

The study projected that accelerated leasing and streamlined permit processing of offshore lands, and halting the trend toward increased withdrawals of onshore lands available for

leasing could increase domestic oil production significantly. These changes in existing policies and procedures were expected to increase projected domestic oil production in 2010 from 6 quadrillion Btus to 16 quadrillion Btus. Additional increases in domestic production could be achieved if the government guaranteed a return on oil investments, relaxed implementation of the Clean Air Act, eliminated EIS requirements, and opened more public lands to oil exploration. However, these additional measures would only increase projected production by 2010 to 18 quadrillion Btus. Even under this most optimistic and permissive regulatory scenario, domestic oil production could not be maintained at current levels, and the trend toward increased reliance on foreign imports could not be reversed (National Academy of Sciences 1979).

ALTERNATIVE "C" - ENDANGERED SPECIES STIPULATION ON T&E PLANT POPULATIONS - NSO ON PINNACLES VIEWSHED

REASONABLY FORESEEABLE DEVELOPMENT SCENARIO

Under this alternative there would be an Endangered Species Stipulation on about 3,840 acres with high oil & gas O&G potential, and an NSO stipulation on about 4,120 acres with moderate or no oil & gas potential. Projections for anticipated O&G exploration and development activities under this alternative are the same as in the Current Management Alternative (Alternative "A"). The Endangered Species Stipulation would place new restrictions on oil & gas lessees and these restrictions could result in delays and surface occupancy prohibitions on portions of some leases. These restrictions however are not expected to be sufficient to affect the overall amount of O&G activity projected.

AIR QUALITY

Air quality impacts would be the same as in the Current Management Alternative (Alternative "A"). There would be increased emissions of ROGs, nitrogen oxides, and particulates in the San Joaquin Valley and North Central Coast air basins. The cumulative impact would result in degradation of air quality and failure to meet federal standards for air quality in the San Joaquin Valley Air Basin. The contribution from federal leases, however, would be negligible.

VEGETATION

Impacts would be the same as described in the Current Management Alternative (Alternative "A") with vegetation severely disturbed on about 1,000 acres affected by federal leases.

THREATENED, ENDANGERED AND OTHER SPECIAL STATUS PLANT SPECIES

Potential impacts within the existing oil fields would be the same as described under the Current Management Alternative (Alternative "A") since curtailing the leasing is not expected to affect these producing leases. There would be a high probability that adverse impacts could occur to T&E listed species and Candidate 2 species if there is any new surface disturbance in the Jacalitos and North Kettleman Dome oil fields prior to comprehensive botanical inventories.

While all known populations of the three T&E listed species would be protected under this alternative, the future of unknown populations on potential habitat that has not been adequately inventoried could be jeopardized if development was permitted prior to the completion of adequate inventories.

Cumulative impacts would be the same as described under the Current Management Alternative (Alternative "A"), with any loss of T&E populations potentially threatening the long-term survival of the affected species. Mitigation measures described under Alternative A would also be appropriate under this alternative. It would not, however, be necessary to defer leasing in areas with occupied T&E plant habitat.

WILDLIFE

Impacts to wildlife would be the same as in the Current Management Alternative (Alternative "A"). There would be no impact within the developed oil fields. There could a temporary impact to as many as 120 acres from exploration activities, and a permanent loss of up to 55 acres of wildlife habitat. Cumulative impacts and mitigation measures would be the same as described under the Current Management Alternative (Alternative "A").

THREATENED, ENDANGERED AND OTHER SPECIAL STATUS ANIMAL SPECIES

Impacts to threatened or endangered animal species would be the same as in the Current Management Alternative (Alternative "A"). Loss of habitat and direct mortality resulting from continued development of the Coalinga oil fields could impact remnant populations of

San Joaquin kit fox and blunt-nosed leopard lizards. Some incidental mortality could occur to these species and to the giant kangaroo rat from exploration and development activities outside the developed oil fields, but these impacts are not expected to affect the vitality of these populations.

WATER QUALITY/EROSION

Impacts would be the same as in the Current Management Alternative (Alternative "A"). Some additional erosion would occur from the disturbance of up to 505 acres, but impacts would be minimal since mitigation would require procedures consistent with regional Best Management Practices (BMPs). There would be a potential for contamination of the Silver Creek drainage if a major spill occurred in the Vallecitos field. There would be a potential for contamination of surface waters during flood events in the San Ardo field if oil tainted liquids are being stored in sumps or oil well cellars within floodplain areas. There would be no impact to groundwater quality.

As per the discussion under the Current Management Alternative (Alternative "A"), there are no anticipated cumulative impacts. Mitigation measures described under the Current Management Alternative would also be appropriate for this alternative.

VISUAL RESOURCES

Under this alternative there would be No Surface Occupancy permitted in the foreground viewshed of the Pinnacles National Monument.

Impacts in the developed oil fields would be the same as in the Current Management Alternative (Alternative "A"). There would be no degradation of existing scenic values. There could be improvement of scenic quality is some oil fields if abandonment procedures result in the removal of unsightly decrepid oil facilities.

Impacts to the I-5 corridor would be the same as in the Current Management Alternative (Alternative "A") with a potential for transforming up to 160 acres from a natural appearing landscape to a semi-industrial setting.

Impacts to Williams Hill would be the same as in the Current Management Alternative (Alternative "A") with potential impacts from new road cuts.

There would be no impact to the Pinnacles National Monument viewshed since adjacent BLM lands are not currently under lease, and any new leases would have an NSO stipulation for portions of the lease within the park foreground viewshed. This would eliminate the potential for future impacts to scenic vistas from the park's trail system.

Cumulative impacts would be the same as described under the Current Management Alternative (Alternative "A"). Abandonments on private leases as well as federal leases in the Kettleman North Dome and Jacalitos fields could result in improvement of scenic quality in these areas. Intense development pressures on private lands could result in federally owned lands providing the only natural vistas on the I-5 corridor between Sacramento and the Grapevine. Mitigation measures identified for the developed oil fields under the Current Management Alternative (Alternative "A") would also be appropriate under this alternative. No cumulative impacts were identified for Williams Hill or the Pinnacles National Monument.

Mitigation measures described under the Current Management Alternative (Alternative "A") would also be appropriate under this alternative.

OIL AND GAS RESOURCES

Impacts to oil & gas resources would be the similar to the Current Management Alternative (Alternative "A") since application of the Endangered Species and NSO stipulations is not expected to affect the level of O&G exploration or development activity.

There could be some delays and additional costs associated with oil & gas exploration and development activities. Delays could occur pending completion of suitable botanical inventories. Following the completion of inventories it is anticipated that exploration and development activities could proceed, and that only minor deviations in drilling plans would be required to avoid impacts to T&E plant populations.

Exploration and development of oil & gas resources in the Pinnacles viewshed would be more expensive since directional drilling from off-site locations could be necessary. The use of directional drilling could double exploration costs. The oil & gas potential of this area, however is rated as moderate, and the potential for discovery of new oil & gas resources in this area is remote.

ALTERNATIVE "D" - ENDANGERED SPECIES STIPULATION ON T&E PLANT HABITAT - NSO ON PINNACLES VIEWSHED

REASONABLY FORESEEABLE DEVELOPMENT SCENARIO

Under this alternative there would be an Endangered Species Stipulation on about 83,160 acres of public land and 85,000 acres of private land with federal mineral ownership. These

areas generally have a high or moderate oil & gas potential. There would also be an NSO stipulation on about 4,120 acres with moderate or no oil & gas potential. Projections for anticipated O&G exploration and development activities under this alternative are the same as in the Current Management Alternative (Alternative "A"). The Endangered Species Stipulation would place new restrictions on oil & gas lessees and these restrictions could result in delays and surface occupancy prohibitions on portions of some leases. These restrictions however are not expected to be sufficient to affect the overall amount of O&G activity projected.

AIR QUALITY

Air quality impacts would be the same as in the Current Management Alternative (Alternative "A"). There would be increased emissions of ROGs, nitrogen oxides, and particulates in the San Joaquin Valley and North Central Coast air basins. The cumulative impact would result in degradation of air quality and failure to meet federal standards for air quality in the San Joaquin Valley Air Basin of which a negligible amount would come from the federal leases.

VEGETATION

Impacts would be the same as described in the Current Management Alternative (Alternative "A") with vegetation severely disturbed on about 1,000 acres affected by federal leases.

THREATENED, ENDANGERED AND OTHER SPECIAL STATUS PLANT SPECIES

Potential impacts within the existing oil fields would be the same as described under the Current Management Alternative (Alternative "A") since curtailing the leasing is not expected to affect these producing leases. There would be a high probability that adverse impacts could occur to T&E listed species and Category 2 species if there is any new surface disturbance in the Jacalitos and North Kettleman Dome oil fields prior to comprehensive botanical inventories.

It is unlikely there would be any impact to T&E plant species in areas outside the producing fields. The only potential impact would be from operations that could occur on existing leases before the leases expire. Any new leases within occupied or potential T&E plant habitat would be issued with an Endangered Species Stipulation unless adequate inventories had been conducted to assure T&E populations did not exist. No disturbance of these areas would be authorized until inventories and subsequent studies indicated there would be no damage to T&E plant populations.

Cumulative impacts would be the same as described under the Current Management Alternative (Alternative "A"), with any loss of T&E populations potentially threatening the long-term survival of the affected species. Mitigation measures for actions described under the Current Management Alternative (Alternative "A") would also still be appropriate under this alternative. It would not, however be necessary to defer leasing in areas with potential or occupied T&E plant habitat.

WILDLIFE

Impacts to wildlife would be the same as in the Current Management Alternative (Alternative "A"). There would be no impact within the developed oil fields. There could be a temporary impact as many as 120 acres from exploration activities, and a permanent loss of up to 55 acres of wildlife habitat. Cumulative impacts and mitigation measures would be the same as described under the Current Management Alternative (Alternative "A").

THREATENED, ENDANGERED AND OTHER SPECIAL STATUS ANIMAL SPECIES

Impacts to threatened, endangered and other special status animal species would be the same as the Current Management Alternative (Alternative "A"). Loss of habitat and direct mortality resulting from continued development of the Coalinga/Avenal oil fields could jeopardize remnant populations of San Joaquin kit fox and blunt-nosed leopard lizards. Some incidental mortality could occur to these species and to the giant kangaroo rat from exploration and development activities outside the developed oil fields, but these impacts are not expected to affect the vitality of these populations.

WATER QUALITY/EROSION

Impacts would be the same as in the Current Management Alternative (Alternative "A"). Some additional erosion would occur from the disturbance of up to 505 acres, but impacts would be minimal since mitigation would require procedures consistent with regional Best Management Practices (BMPs). There would be a potential for contamination of the Silver Creek drainage if a major spill occurred in the Vallecitos field. There would be a potential for contamination of surface waters during flood events in the San Ardo field if oil tainted liquids are being stored in sumps or oil well cellars within floodplain areas. There would be no impact to groundwater quality.

As per the discussion under the Current Management Alternative (Alternative "A"), there are no anticipated cumulative impacts. Mitigation measures described under the Current Management Alternative would also be appropriate for this alternative.

VISUAL RESOURCES

Impacts would be the same as described for the Endangered Species Stipulation on T&E Plant Habitat - NSO On Pinnacles Viewshed Alternative (Alternative "C").

There would be no impact to the Pinnacles viewshed since no surface occupancy would be permitted in the foreground viewshed of the monument.

Impacts in the developed oil fields would be the same as in the Current Management Alternative (Alternative "A"). There would be no degradation of existing scenic values in the oil fields. However abandonment procedures in some fields could improve scenic quality by removing unsightly decrepid oil facilities.

Impacts to the I-5 corridor would be the same as in the Current Management Alternative (Alternative "A") with a potential for transforming up to 160 acres from a natural appearing landscape to a semi-industrial setting.

Impacts to Williams Hill would be the same as in the Current Management Alternative with potential impacts from new road cuts.

Cumulative impacts would be the same as described under the Current Management Alternative (Alternative "A"). Abandonments on private leases as well as federal leases in the Kettleman North Dome and Jacalitos fields could result in improvement of scenic quality in these areas. Intense development pressures on private lands could result in federally owned lands providing the only natural vistas on the I-5 corridor between Sacramento and the Grapevine. Mitigation measures identified for the developed oil fields under the Current Management Alternative (Alternative "A") would also be appropriate under this alternative. No cumulative impacts were identified for Williams Hill or the Pinnacles National Monument.

Mitigation measures described under the Current Management Alternative (Alternative "A") would also be appropriate under this alternative.

OIL AND GAS RESOURCES

Impacts to oil & gas resources would be similar to the Current Management Alternative (Alternative "A") since application of the Endangered Species and NSO stipulations is not expected to affect the level of O&G exploration or development activity.

There could be some delays and additional costs associated with oil & gas exploration and development activities. Delays could occur pending completion of suitable botanical inventories. Following the completion of inventories it is anticipated that exploration and

development activities could proceed, and that only minor deviations in drilling plans would be required to avoid impacts to T&E plant populations.

Exploration and development of oil & gas resources in the Pinnacles viewshed would be more expensive since directional drilling from off-site locations could be necessary. The use of directional drilling could double exploration costs. The oil & gas potential of this area, however is rated as moderate, and the potential for discovery of new oil & gas resources in this area is remote.

ALTERNATIVE "E" - NO LEASING IN T&E ANIMAL HABITAT

REASONABLY FORESEEABLE DEVELOPMENT SCENARIO

Under this alternative there would be no new leasing within the habitat of threatened or endangered animal species except within the developed oil fields. About 55% of the moderate/high potential lands would not be available for leasing and subsequent exploration under this alternative. Some exploration activity could still occur in these areas during the next five years since about 20% of the habitat area is already under lease. O&G exploration and development activities probably would not be significantly different than projected under the Current Management Alternative (Alternative "A"). Because less land would be available for O&G exploration, this alternative could result in fewer exploration wells than projected under the Current Management Alternative. This difference, however, is probably insignificant since, under the Current Management Alternative, the total number of exploration wells projected in the high/moderate potential areas was only four to six wells.

AIR QUALITY

Air quality impacts would be the same as in the Current Management Alternative (Alternative "A"). There would be increased emissions of ROGs, nitrogen oxides, and particulates in the San Joaquin Valley and North Central Coast air basins. The cumulative impact would result in degradation of air quality and failure to meet federal standards for air quality in the San Joaquin Valley Air Basin with a negligible amount related to federal leases.

VEGETATION

Impacts would be the same as described in the Current Management Alternative (Alternative "A") with vegetation severely disturbed on about 1,000 acres affected by federal leases.

THREATENED, ENDANGERED AND OTHER SPECIAL STATUS PLANT SPECIES

Potential impacts within the existing oil fields would be the same as described under the Current Management Alternative (Alternative "A") since curtailing the leasing is not expected to affect these producing leases. There would be a high probability that adverse impacts could occur to three T&E listed species and one Category 2 species if there is any new surface disturbance in the Jacalitos and North Kettleman Dome oil fields prior to comprehensive botanical inventories. Impacts could also occur to these species in the Vallecitos oil field.

It is very unlikely there would be any impact to T&E plant species in areas outside the producing fields. The only potential impact would be from operations that could occur on existing leases before the leases expire. No new leases would be issued on about 168,160 acres of potential T&E plant habitat which overlaps with the T&E animal habitat. Any new leases within the remaining occupied or potential T&E plant habitat would be issued with an Endangered Species Stipulation unless adequate inventories had been conducted to assure T&E populations did not exist. No disturbance of these areas would be authorized until inventories and subsequent studies indicated there would be no damage to T&E plant populations.

Cumulative impacts would be the same as described under the Current Management Alternative (Alternative "A"), with any loss of T&E populations potentially threatening the long-term survival of the affected species. Most mitigation measures for actions described under the Current Management Alternative would also still be appropriate under this alternative. It would not, however be necessary to defer leasing in areas with potential or occupied T&E plant habitat since the NSO stipulation would protect these species.

WILDLIFE

Impacts would be similar to those described for the Current Management Alternative (Alternative "A"). There would be no impacts to wildlife within the developed oil fields. T&E animal habitat areas that would not be leased under this alternative are all annual grasslands. There would be less potential for impact to upland gamebirds since much of their habitat would remain unleased under this alternative.

There would be a potential for temporary impact to as many as 120 acres from exploration activities, and a permanent loss of up to 55 acres of wildlife habitat. Most of these impacts would occur in chaparral habitats since exploration activities would be prohibited in most annual grasslands.

Cumulative impacts and mitigation measures would be the same as described under the Current Management Alternative.

THREATENED, ENDANGERED AND OTHER SPECIAL STATUS ANIMAL SPECIES

Potential impacts within the existing oil fields would be the same as described under the Current Management Alternative (Alternative "A") since this alternative would not affect leasing in the developed oil fields. Continued development of the Coalinga oil fields could jeopardize remnant populations of San Joaquin kit fox and blunt-nosed leopard lizard.

It is very unlikely there would be any impact to T&E animal species in areas outside the producing fields. The only potential impact would be from operations that could occur on existing leases before the leases expire. Most existing leases in T&E habitat would expire during the next five to six years and under this alternative would not be renewed.

Cumulative impacts would be the same as described under the Current Management Alternative (Alternative "A"), with most San Joaquin Valley habitats on private land potentially lost by 1996 given current rates of development. Mitigation measures for actions within the developed oil fields described under the Current Management Alternative would also still be appropriate under this alternative.

WATER QUALITY/EROSION

Impacts would be the same as in the Current Management Alternative (Alternative "A"). Some additional erosion would occur from the disturbance of up to 505 acres, but impacts would be minimal since mitigation would require procedures consistent with regional Best Management Practices (BMPs). There would be a potential for contamination of the Silver Creek drainage if a major spill occurred in the Vallecitos field. There would be a potential for contamination of surface waters during flood events in the San Ardo field if oil tainted liquids are being stored in sumps or oil well cellars within floodplain areas. There would be no impact to groundwater quality.

As per the discussion under the Current Management Alternative (Alternative "A"), there are no anticipated cumulative impacts. Mitigation measures described under the Current Management Alternative would also be appropriate for this alternative.

VISUAL RESOURCES

Impacts in the developed oil fields would be the same as in the Current Management Alternative (Alternative "A"). There would be no degradation of existing scenic values and improvement in the oil fields, however abandonment procedures in some fields could result in the removal of unsightly decrepid oil facilities.

Leasing would not be permitted within the viewshed of the I-5 corridor since all federal lands in the I-5 foreground or middleground area are habitat for T&E animals. Some impacts could still occur in the I-5 corridor, however it is not very likely since few federal lands are currently under lease and most of these leases would expire within the next five to six years.

Impacts to Williams Hill would be the same as in the Current Management Alternative with potential impacts from new road cuts.

Cumulative impacts within the oil fields would be the same as described under the Current Management Alternative. Abandonments on private leases as well as federal leases in the Kettleman North Dome and Jacalitos fields could result in improvement of scenic quality in these areas.

Since no development would occur on federal lands in the I-5 viewshed, cumulative impacts to the viewshed are not addressed in this alternative. No cumulative impacts were identified for Williams Hill or the Pinnacles National Monument.

Mitigation measures described under the Current Management Alternative would also be appropriate under this alternative except that measures specific to the I-5 viewshed would not be necessary.

OIL AND GAS RESOURCES

Opportunities for the discovery of a new oil & gas field on federal lands would be compromised since about 55% of the high and moderate O&G potential areas that are outside existing oil fields would not be available for oil & gas leasing. There is however a less than 5% chance that a new oil or gas field would be discovered in the high potential areas if all lands remained available for leasing, and even remoter change that a discovery could occur on lands with moderate potential.

This would eliminate the potential for discovery of between 200,000 and 1,000,000 barrels of oil or gas (Milliken 1990c). This compares with known California reserves of 5.9 billion barrels. The failure to discover these reserves of 200,000 to 1,000,000 barrels of oil on public lands would have no discernable impact on the ability of California or the United States to be self-sufficient in the production of oil or gas resources.

Cumulative Impacts

While the failure to discover this new oil & gas field in the Hollister Resource Area would have virtually no impact on the U.S. production of oil & gas, it is but one of numerous actions that cumulatively could affect the availability of oil & gas resources in the United States. Eliminating existing regulatory barriers impeding oil & gas production however,

would not be able to reverse the trend toward increased reliance on foreign imports (National Academy of Sciences 1979). Refer to the section of this chapter on Oil and Gas Resources under the No Leasing Alternative (Alternative "B") for additional discussion of cumulative impacts.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

The primary resource use proposed in this amendment is the exploration and development of oil & gas resources. This exploration and development would directly impact areas that were actually occupied by oil production facilities. The maximum acreage affected would be 505 acres. Long-term productivity could also be affected indirectly by widespread damage to natural vegetation and increased incidence of respiratory diseases resulting from prolonged exposure to air pollution.

IRREVERSIBLE / IRRETRIEVABLE COMMITMENT OF RESOURCES

Oil & gas resources are a nonrenewable resource. A decision to extract oil & gas from federal lands is an irretrievable commitment of our limited domestic supplies of energy resources. The potential loss of T&E plant and animal populations could be the catalyst for an irreversible demise of these species resulting in the irretrievable loss of natural diversity and irretrievable loss of biological and genetic components.

CHAPTER FIVE
COORDINATION AND CONSULTATION

INTRODUCTION

This Environmental Impact Statement and land use plan amendment was prepared by an interdisciplinary team of specialists from the Bureau of Land Management's Hollister Resource Area, Bakersfield District Office, and California State Office. Reviews for accuracy and consistency were provided by both district office and the state office staff. Table #11 is a list of preparers.

Consultation, coordination, and public involvement have occurred throughout the process through public workshops, informal meetings, individual contacts, news releases, and *Federal Register* notices.

Initial steps in the process began in 1990 with the development of a preparation plan. Other early efforts included research, inventory, preliminary analysis, and interagency coordination.

PUBLIC PARTICIPATION

A public participation plan was prepared to ensure that the public would have numerous opportunities to be actively involved in the planning and environmental process. Both formal and informal input have been encouraged and used throughout the planning process.

A Notice of Intent (NOI) to Prepare the Plan Amendment and an Environmental Impact Statement was published in the Federal Register on January 24, 1990. Copies of the NOI were mailed on January 26, 1990 to 180 interested and/or affected parties using the Resource Area's updated mailing list. Ninety of these individuals did not respond to the mailing and were removed from the mailing list.

The Notice of Intent included times and dates for three scheduled public workshops and a listing of.proposed issues to be addressed in the EIS. Publication of the Notice of Intent in the *Federal Register* initiated a formal 30 day public comment period.

Tentative issues, planning criteria, and alternatives were published in the NOI to serve as a starting point for public and agency dialogue. The final issues and alternatives addressed in the EIS were developed in response to public and agency comment. BLM staff conducted meetings with all affected or interested federal, state, and local agencies. Open houses (workshops) were held in Hollister, King City, and Coalinga.

The Notice of Availability (NOA) of Planning Criteria was published in the *Federal Register* on June 6, 1991. Copies of the NOA were mailed to 90 individuals or organizations. Publication of the NOA in the *Federal Register* initiated another formal 30 day public comment period.

Copies of the Draft RMP Amendment and EIS were sent to 90 individuals and organizations who responded to previous mailings, and to agencies, governments, and corporations potentially affected by the plan. Sixteen comments were received in response to the distribution of the Draft EIS. Substantive comments and agency responses are in the last section of this chapter.

CONSISTENCY

Coordination with other agencies and consistency with other plans has been accomplished through frequent communication with agency representatives and judicious review of plans.

Regional water quality plans, air pollution control district plans, and county land use plans have been consulted to assure that all BLM proposed actions are consistent with local and regional plans. The Monterey Bay Unified Air Pollution Control District has indicated that the EIS Proposed Action is consistent with the current District Air Pollution Control Plan.

State water quality control plans, Division of Oil & Gas procedures, and Department of Fish & Game habitat plans have also been consulted to assure consistency. Copies of the NOI were distributed to the California State Clearinghouse to facilitate distribution and comment from interested state agencies.

Current management plans for the Los Padres National Forest and the Pinnacles National Monument were reviewed for consistency. U.S. Fish & Wildlife Service recovery plans for T&E species were also reviewed.

Monterey Bay Regional Park District
Association of Monterey Bay Governments
San Benito County Planning Dept
Fresno County Planning Dept
Merced County Planning Dept
Westside Resource Conservation District
Congressman Leon Panetta
Fresno County Air Pollution Control Board

OTHER ORGANIZATIONS

CA Native Plant Society
Dept of Biology, CU/Fresno
Sierra Club (SF Branch)
Hastings Institute, (UC/Berkeley)
PG & E
District Multiple Use Advisory Council (John Blake)

CONSULTATION AND COORDINATION

Members of the interdisciplinary team have consulted formally and informally with numerous agencies, groups, and individuals during the development of the land use plan amendment and EIS. Following is a list of organizations that have participated in this planning process.

INDUSTRY REPRESENTATIVES

ARCO
Texaco
Shell
Chevron
California Energy Co.
Western Mining Council
Western States Petroleum Assn
Faber & Associates
Union Oil Co.
Lynn Title Services
Molycorp Inc.
Kern County Prospectors
Phillips
Victory Oil Co.
Tule Gem & Mineral Society

GOVERNMENT AGENCIES/ELECTED OFFICIALS

CA Dept of Fish & Game
CA Energy Commission
CA State Lands Commission
CA Div of Oil & Gas
State Historic Preservation Office
US Bureau of Reclamation
US Fish & Wildlife Service
US Soil Conservation Service (Salinas)
US Soil Conservation Service (Fresno)
US Soil Conservation Service (Gilroy)
Pinnacles National Monument
Monterey County Planning Dept
Monterey Bay Unified Air Pollution Control District

PUBLIC COMMENTS / AGENCY RESPONSES

COMMENT LETTER # 1
FRED BEDDALL
236 B FRISBIE ST # B
OAKLAND, CA 94611

Comment 1.1 - In fact, leases in certain areas immediately contiguous to the park might have minimal visual impact, while areas well outside your "visual impact" circle might have large impact. I believe you should revise this analysis, using photos and maps from many of the higher trails and peaks in the park. It seems to me that slope aspect and elevation must be taken into account, at least within ten or fifteen miles from the Park to the mountains south and east. A ridgetop O & G development and attendant access roads and power lines in this direction might be very obvious, while a valley floor development closer to the Park would be virtually invisible.

Response 1.1 - The analysis of potential visual impacts to the Pinnacles National Monument was based on field evaluations that included mapping of areas seen from major road access and trail systems within the Monument. Subsequent evaluation included application of well established visual resource analysis techniques to evaluate the significance of impacts. Detailed mapping and field reports are available for review at the Hollister Resource Area Office, 20 Hamilton Court, Hollister, CA.

COMMENT LETTER #2
JANET BRENNAN
MONTEREY BAY UNIFIED AIR
POLLUTION CONTROL DISTRICT
24580 SILVER CLOUD COURT
MONTEREY, CA 93940

Comment 2.1 - Page 30, para. 1. The typo which references total suspected particulates should be corrected.

Response 2.1 - The typo has been corrected in the Final EIS.

Comment 2.2 - Page 31, para. 3. Air quality data should be updated through 1992...Page 31. Reference is made to the 1989 Air Quality Management Plan. A 1991 Plan was adopted in December, 1991 and should be used as a source of emission inventory data in the EIS. The document states the 1989 AQMP anticipates that the region will be able to meet federal AAQS for ozone by 2005. The latest data indicate that the federal ozone standard may have

been met since there has been fewer than four exceedances of the federal standard in the last three years.

Response 2.2 - The Final EIS has been updated to include data from the 1991 Plan and this comment.

Comment 2.3 - Pages 67 and 70., para. 4 & 5 respectively. Emission estimates are provided for drilling activity; however, the period of time for which the pollutants are estimated is not stated, i.e., daily, annual, etc.

Response 2.3 - The emission estimates are based on the average emissions to complete drilling of an exploration or development well. It is not possible to extract the average figure used from the data published in the Dennison, et al (1983) source, but it would appear to be around six operating days.

Comment 2.4 - Page 71. The District estimates NO_x emissions for a diesel fueled drill rig at 305 lbs/day of operation or a total of 6,100 lbs for a typical well operation (assuming 20 days). This averages to approximately 17 lbs/day per rig over 365 days per year. Assuming seven wells were drilled at once, average daily emissions would be 119 lbs/day. The proposed project is consistent with the 1991 AQMP which forecasts 220 lbs/day of NO_x emissions from all drilling activities within Monterey County for the period from 1994 through 2010.

Response 2.4 - This information has been added to the Final EIS.

Comment 2.5 - Page 72. The DEIS states, "Air modeling studies could be required before any emissions were allowed on leases potentially impacting the Pinnacles National Monument. If the studies indicated that the air quality of the monument would be impacted, then use of electric power could be required to minimize air quality impacts on the monument."

District staff is not aware of a project specific model for predicting ozone concentrations, the pollutant of primary concern; however, models for PM_{10} and certain attainment pollutants are available to predict air quality impacts.

Drilling operations within the North Central Coast Air Basin are generally subject to District Rule 207, Review of New or Modified Sources. In particular, Prevention of Significant Deterioration provisions would apply to oil well operations affecting the Pinnacles National Monument and would require modeling for attainment pollutants and controls to prevent specified levels of degradation from occurring.

Response 2.5 - The discussion on air quality modelling and the proposed air modelling stipulation have been modified in the Final EIS to incorporate these comments.

COMMENT LETTER #3
JOHN E. GOFF
430 FREITAS ROAD
HOLLISTER, CA 95023

Comment 3.1 - The subject of Earthquakes do to stimulate of the earth, do to accelerated use of more oil and gas development in fault area by greater extraction. Not covered in Draft we are sensitive to that subject after Loma Prieta.

Response 3.1 - We are not aware of any scientific evidence which indicates there is any correlation between oil and gas production and increased risk of earthquakes. If the respondent is aware of such studies, we would gladly evaluate them and consider the additional risk, if any, from development related to oil and gas development on federal lands.

COMMENT LETTER #4
SHELTON R. GRAY
CALIFORNIA REGIONAL WATER QUALITY
CENTRAL VALLEY REGION
3614 EAST ASHLAN AVE
FRESNO, CA 93726

Comment 4.1 - Page 13, paragraph 3 - "The BLM has standard operating procedures that are designed to protect groundwater resources during oil & gas exploration activities . . . which include well casing requirements, subsurface disposal of wastes, spill contingency plans, and abandonment procedures."

"Standard operating procedures" should address discharges of crude oil and/or wastewater to sumps. Anyone discharging or proposing to discharge waste to land needs to file a Report of Waste Discharge and appropriate filing fee with the Regional Water Quality Control Board.

Response 4.1 - The comment has been incorporated into the text of the Final EIS.

Comment 4.2 - Page 58, paragraph 2 - "California code does not permit the construction of oil or wastewater sumps in natural drainage channels (SWRCB 1975)."

The correct reference is Title 14 CCR, Section 1770(a).

Response 4.2 - The reference has been added to the Final EIS.

Comment 4.3 - Page 59, paragraph 1 - "In 1988 a large oil spill occurred when a pipeline erupted on a federal lease in the Coalinga area resulting in spillage of 20,000 to 30,000 barrels of oil (Milliken 1990c)."

In accordance with current regulations all oil/water spills of 1 barrel or more are required to be reported (such as the Silver Creek spill) to the Office of Emergency Services and appropriate agencies. Our office has no record of a major oil spill involving surface drainages or impacting water quality. The intent of including this information under the heading water quality/surface water is unclear.

Response 4.3 - The text has been modified in the Final EIS to clarify that water quality was not affected by this spill. The intent of including this information in the Water Quality/Surface Water discussion was to document that large oil spills, which could potentially affect water quality, can and do occur on federal oil leases.

Comment 4.4 - Page 59, paragraph 2 (GROUNDWATER) - "The groundwater has also been contaminated by past oil field waste disposal practices (FCPC 1980). Because the groundwater is contaminated, drinking water is imported under contract from the U.S. Water and Power Resource Service."

We are unaware of any studies concluding that oil field disposal practices have been determined to be responsible for ground water (drinking water) contamination in the Coalinga area. As noted below, the Basin Plan (and amendments) establishes beneficial uses (unless an exception is adopted) for waters of the state (ground and surface waters). Any discharge of waste to land needs to protect not only drinking water, but all beneficial uses.

Response 4.4 - The discussion in the Draft EIS related to Coalinga groundwater contamination was based on information in the Coalinga Regional Plan prepared by the Fresno County Planning Commission (FCPC 1980). In the Final EIS this discussion has been modified to clarify that drinking water is imported because groundwater quality is poor.

Comment 4.5 - Page 59, paragraph 3 - "The Regional Water Quality Control Plan does not identify any groundwater basins in the Vallecitos area (CWRCB 1990)."

Silver Creek, the principal drainage traversing the Vallecitos oil field, is part of the West Side streams portion of the Tulare Lake Drainage Basin (5D) planning area. Designated beneficial uses of the ground water include municipal, agricultural, and industrial supply.

The correct acronym for the Central Valley Regional Water Quality Control Board is CVRWQCB.

Response 4.5 - The text of the Final EIS has been changed to incorporate this comment.

Comment 4.6 - **Page 88, GROUNDWATER, paragraph 3** - "California code and BLM procedures now prohibit the use of unlined sumps where there is any potential to impact groundwater aquifers (SWRCB 1975;EPA 1986)."

We are unaware of any regulations specifically prohibiting the use of unlined sumps. The Tulare Lake Basin plan (5D) however prescribes numerical water quality objectives for discharges to unlined sumps overlying good quality ground water.

Response 4.6 - The referenced code is cited in the Water Quality Control Plan Report for the Tulare Lake Basin (5D) (1975) as Section 1770 (a) of the California Administrative Code which states "Unlined evaporation sumps, if they contain harmful waters, shall not be located over freshwater-bearing aquifers" (Title 14, Chapter 4, Subchapter 2, Articles 1, 2, and 3).

Comment 4.7 - We suggest it may be appropriate to mention the following under the subject of Water Quality :

Disposal of oil production wastewater via Class-II injection wells within recognized oilfields is regulated by the California Division of Oil and Gas. The Regional Water Quality Control Board regulates the discharge of oil production wastes to land. In accordance with the California Water Code, anyone proposing to discharge oilfield exploration and/or production wastes to land needs to file a Report of Waste Discharge application and filing fee with the Regional Board.

Response 4.7 - The suggested language has been added to the Final EIS.

COMMENT LETTER #5
RICHARD F. CURTIN
DIVISION OF OIL AND GAS
466 NORTH FIFTH STREET
COALINGA, CALIFORNIA 93210

Comment 5.1 - Summary - page 2, last paragraph: The word "area" should be inserted following "Coalinga/Avenal" in the first line. There is no field named "Avenal".

Response 5.1 - The suggested change has been made in the Final EIS.

Comment 5.2 - Chapter 1 - page 13, issue #5: The second paragraph gives the mistaken impression that the spill in Vallecitos field was not cleaned up.

Response 5.2 - The word "temporary" has been added before "contamination" to clarify that the impact has been eliminated.

Comment 5.3 - Chapter 3 - page 34: The correct names of the fields in second paragraph are Jacalitos and Kettleman North Dome not Jacalitos Hills and North Kettleman Dome.

Response 5.3 - The correction has been made in the Final EIS.

Comment 5.4 - Chapter 3 - page 59, paragraphs titled GROUNDWATER: The statement that water is imported due to contamination is totally incorrect. Water is imported because the groundwater is of very poor quality.

Response 5.4 - The suggested correction has been made in the Final EIS.

Comment 5.5 - Chapter 3 - Table 8: The correct field name is Kettleman North Dome not Kettleman Dome.

Chapter 4 - page 64, first sub-paragraph: The word "field" should be "fields" as there is more than one field in the Coalinga/Avenal area.

Chapter 4 - page 64, sub-paragraph E): There will be many more wells abandoned than drilled. The current ratio is 2:1.

Chapter 4 - page 100, paragraphs title Cumulative Impacts: Fifth line of first paragraph should read "...1980s which has depressed prices..."

Appendix B - page 124, first complete paragraph: Fifth line should read "geophone, by one-half the travel time..."

Appendix B - page 127, final paragraph: Second line should read "a square or hexagonal hole in a large ..." The word "kelley" is correctly spelled "kelly".

Appendix C - page 132, fourth paragraph: The word "rehabed" should be "rehabilitated".

Response 5.5 - The corrections noted above have been made in the Final EIS.

COMMENT LETTER #6
UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY
REGION IX
75 HAWTHORNE STREET
SAN FRANCISCO, CA 94105

Comment 6.1 - The rationale for the proposed modified leasing strategy presented in the document suggests that protection of threatened and endangered (T&E) plant species and wildlife habitat would be enhanced by restricting surface-use for oil and gas activities. The DEIS does not make it clear, however, whether the entire 7,960 acres would actually remain designated as permanent NSO, or whether 3,840 of these acres (set aside in the preferred alternative specifically to protect "T&E **plant** populations" - as opposed to wildlife habitat)

is actually conditional, i.e., to be re-designated "once conditions sufficient to protect the T&E botanical species have been met." Nor does the DEIS identify the "conditions" which would allow surface occupancy of an area initially designated as conditional NSO.

Response 6.1 - To eliminate confusion over use of a "conditional" NSO, the description of this lease restriction has been changed in the Final EIS from a "conditional" NSO to a special Endangered Species Stipulation. The proposed stipulation that would be used, which specifies the conditions under which surface activities would be permitted, has been included in the Final EIS as Appendix E.

Comment 6.2 - The DEIS does not explain why, in keeping with the stated purposed of protecting T&E botanical species and wildlife habitat, the Bureau of Land Management favors issuing leases with NSO restrictions rather than simply not leasing a given tract. We expect that this strategy may be proposed to ensure that federally owned oil and gas minerals are not drained from a nearby federal lease without compensation, i.e., to protect the mineral resource. However, the DEIS does not provide sufficient information to evaluate the underlying rationale of issuing such leases nor does it evaluate the effectiveness of issuing leases with no surface occupancy in comparison with no-leasing. In addition, it is not clear in the DEIS whether entire leases are issued as NSO leases or whether portions of leases contain NSO stipulations for specific areas within a designated lease boundary (refer to Sierra Club v. Peterson 717F. 2d. 1409 (D.C Cir 1983). The Final Environmental Impact Statement (FEIS) should provide additional details on these issues so as to "provide a clear basis for choice among options..." (40 CFR 1502.14).

Response 6.2 - The use of the NSO restriction has been limited in the Final EIS to relatively small areas where directional drilling could occur off-site without impacting similar resource values that the NSO is designed to protect. The BLM favors the use of NSO restrictions where directional drilling or other techniques could be used to recover the underlying oil without incurring significant environmental impacts. Substitution of the special Endangered Species Stipulation in the Final EIS for the "Conditional" NSO used in the Draft helps to clarify the intent of this restriction which is to allow O&G activities following identification and mitigation of any potential site-specific T&E conflicts.

Comment 6.3 - While we understand that, at least conceptually, directional drilling could be employed when leases are issued with a no surface occupancy stipulation we also understand that under certain circumstances subsurface geology could preclude such an option. The FEIS should provide information on past directional drilling efforts to explore for minerals on NSO leases, and information on geology in the Hollister Resource Area which would allow or disallow directional drilling. It would also be helpful if the FEIS would reference any recent legal decision which support leasing without allowing surface occupancy.

While it is evident that NSO stipulations are intended to protect certain environmental (and minerals) resources, we are concerned that simply issuing leases with NSO stipulations may not offer the extent of protection necessary for some environmental resources, especially in

instances where directional drilling is infeasible. Within that context, we would be interested to know if a drilling permit (APD) has ever been denied once a lease has been issued, and if surface occupancy (for access, drilling, etc.) has ever been allowed on a lease that was issued with a NSO stipulations? If so, it would be appropriate in the FEIS to identify and discuss how BLM would address such a situation should it develop in the Hollister Resource Area.

In addition, the FEIS should specify how the proposed leasing process would accommodate scenarios such as an expiring NSO lease. For instance, should such a lease be ready to expire without being developed, would the BLM allow the lessee to occupy the surface to develop the lease at the potential expense of T&E species? If so, the DEIS should include a detailed discussion of the environmental protection strategy that would be employed by BLM to ensure adherence to environmental laws and regulations. If not, the DEIS should explain how the lease would then be construed as not being a "de facto 'No leasing' decision" as described in the DEIS.

Response 6.3 - The limiting factors for using directional drilling are most related to economics and technical feasibility. Geology, per se, is not usually a significant factor.

From an economic viewpoint, a directional well can be from 50% to 200/300% more expensive than a straight hole, depending on depth, horizontal stepout, angle of deviation, hole size, and other factors. Obviously, being required to directionally drill would raise the cost and lessen the economic incentive to develop some otherwise economic targets. Lessees would consider these additional exploration and development costs when they bid on a particular lease encumbered by an NSO stipulation.

Technical feasibility is most often related to one of two factors. The first is that the closest available surface location is too far away for a drilling rig to be able to reach the target using existing technology (a combination of depth and distance). The second, somewhat related to the first, is that the zone is too shallow for sufficient angle to be built up from an offsite location. For example, if a zone were only a few hundred feet deep in the center of a several hundred acre parcel, it might not be reachable from offsite.

One particular legal decision allowing leasing with an NSO stipulation (out of many) is Connor v. Burford. In that decision, the judge stated that if no adequate EIS had been written prior to leasing, an NSO could be used (Ninth Circuit Court).

In general, the use of NSOs has been infrequent in California, so there is very little history upon which to base future projections. Leases issued with NSO stipulations would have waiver provisions; however the NSO would apply unless information was available that the resources of concern could be adequately protected or mitigated, or that the conditions which caused the stipulation to be used in the first place had changed. Per 43 CFR 3101.1-4 any waiver of a stipulation which is of "major concern to the public" would have to be posted in a public place for 30 days.

Also see response 6.2.

Comment 6.4 - On July 2, 1991, we provided comments on the Notice of Intent (NOI) to prepare the Hollister Oil and Gas DEIS. At that time we suggested several topics for discussion, many of which are addressed in the DEIS. However, we found that the DEIS does not address the issue of impacts to floodplains and wetlands, specifically in terms of Clean Water Act S404 requirements and proposals to accommodate those requirements. We recommend this important topic be discussed in the FEIS.

Response 6.4 - Floodplains and wetlands were not addressed as a specific topic in the Draft EIS. Impacts to these resources, however, were considered and were documented in several sections of the Draft EIS. Management guidance that applied to all alternatives included "specialized habitats such as riparian areas, vernal pools...would be avoided by surface disturbing activities when practical" (page 15). Additional guidance required that "standards and guidelines in the Surface Operating Standards for Oil and Gas Exploration and Development (RMRCC 1989) would be applied to all oil and gas exploration and development activities" (page 16). These standards include specific technical guidance for designing facilities to avoid disruption of natural drainages. In the Environmental Consequences Chapter (Chapter 4) in the discussion on impacts to Surfaced Water/Erosion the Draft EIS stated "No impacts to surface water are expected to occur from flooding and high runoff events since BLM procedures require that all oil storage and waste facilities be located away from established drainage patterns (EPA 1986)" (page 88). In the Introduction to Chapter Three - Affected Environment, the Draft EIS stated "With implementation of standard mitigation measures and the management guidance that applied to all alternatives, the following resources are not expected to be affected by the oil & gas leasing program:...wetlands, floodplains..." (page 29).

In the Final EIS, a new subsection addressing "Floodplains and Wetlands" has been added to the Water Quality/Erosion discussions in Chapter Three (Affected Environment) and Chapter Four (Environmental Consequences) to provide better documentation of the analysis conducted on these resource values. A new mitigation has been added and existing policy has been reworded to emphasize specific measures that would provide for protection of floodplains and wetlands. These specific measures include addition of floodplains and wetlands as specialized habitats to be avoided whenever possible, prohibition of oil sump construction and storage of oil tainted liquids in oil well cellars within floodplain areas, and prohibitions on construction of structures that will impede floodwaters per county zoning requirements. It has also been emphasized in the Final EIS that Section 404 Clean Water Act permits would be required for specific projects that could result in discharge of fill or dredged materials in navigable waters.

Comment 6.5 - In terms of air quality, the DEIS contends that federal leases would provide a negligible amount of NOx, PM-10, and ROG emission although cumulative air emission would "result in the degradation of air quality and failure to meet federal

standards for air quality." While it may be true, as stated in the DEIS, that oil and gas activities taking place in the private sector produce more emissions than those on federal leases, the fact remains that emissions from federally controlled activities do contribute to exceedences of the National Ambient Air Quality Standards (NAAQS) in the San Joaquin Valley Air Basin, as also acknowledged in the DEIS. In addition, the DEIS states that "the projected inability of Fresno County to meet federal standards for air pollutant emissions can be expected to result in lung damage to individuals with asthma or emphysema, and nausea, headaches, irritated eyes, and dizziness among otherwise healthy individuals, particularly the young and elderly, and in continued crop damage..." With these statements in mind, the FEIS should discuss how the proposed leasing activities would meet the conformity requirements detailed in section 176 (C) of the CAA.

Response 6.5 - The conformity requirements in Section 176(c) of the Clean Air Act (CAA) require that federal agency actions be in conformance with Implementation Plans adopted under Section 110 of the CAA. The San Joaquin Valley Unified Air Pollution Control District's 1991 Air Quality Attainment Plan indicates that the district will not be able to meet pollution reduction targets despite the "expeditious implementation of all feasible control measures" (SJVUAPCD 1992). The BLM Draft EIS requirement that "all oil & gas exploration and development activities that require off-road vehicle use or surface disturbance would be required to obtain an air quality emission permit or verification that such permits are not appropriate from the regional air quality control board" will assure that activities on BLM managed lands would be in conformance with requirements established by the Implementation Plan.

COMMENT LETTER #7
STOWE KILLINGSWORTH
1112 I STREET, #350
SACRAMENTO,CA 95814

Comment 7.1 - Page 2, Air Modelling Studies - Who is to perform these, how long will it take, who pays for them?

Response 7.1 - The project applicant would be responsible for providing appropriate air modelling studies for their proposed activity. Contractors can usually complete the studies within several days. The stipulation has been modified to clarify that the intent of the measure was to support air modelling studies that are already required by the Monterey Bay Unified Air Pollution Control District (see comment 2.5).

Comment 7.2 - Page 3, What do you mean by redundant oil well facilities? How are you working with SJVUAPCD on air emissions (BACT)? Who does evaluation of electric motors in lieu of diesel powered drilling rigs and pump jacks?

Response 7.2 - Redundant oil well facilities refers to facilities that are no longer needed by the industry and are scheduled for abandonment and reclamation. The BLM has been working closely with the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) in the development of new air emission procedures. The BLM Bakersfield District air quality specialist is a member of the SJVUAPCD's Citizen's Advisory Group. The Air Quality Control Board has established a listing of feasible measures for controlling pollution from stationary sources. Application of these measures to the San Joaquin Valley is addressed in the 1991 Air Quality Attainment Plan for the San Joaquin Valley Air Basin (SJVUAPCD 1992). The stipulation to evaluate substitution of electric motors in lieu of diesel powered rigs has been dropped in the Final EIS since the SJVUAPCD is currently studying this issue with final implementation rules scheduled for adoption in 1994.

Comment 7.3 - Page 5, You state that new stipulations cannot be applied to existing leases and then you say existing lease operations could be affected by decisions made in this plan. This seems to be contradictory. Please explain.

Response 7.3 - Existing lease operations could be affected by decisions made in this plan, since elements of new stipulations could be applied as conditions of approval for new activities on existing leases (Applications for Permits to Drill, etc.). Any new restrictions would, however have to be consistent with the lease rights of the lessees, and could not preclude exploration and development of potential oil & gas resources.

Comment 7.4 - Page 8, Special stipulations can include seasonal restrictions or even a prohibition against any use of the surface. No surface occupancy - who decides? How can you have oil and gas production with no surface occupancy?

Response 7.4 - The purpose of this Resource Management Plan Amendment and Environmental Impact Statement is to determine which public lands should be leased subject to Special Stipulations including No Surface Occupancy stipulations. Directional drilling can be used to explore and develop oil & gas resources on leases with No Surface Occupancy restrictions (also see response 6.3). Production can also occur when federal oil resources are drained by production wells on adjacent lands.

Comment 7.5 - Page 9, The BLM conducts an environmental review of the drilling proposal and may require additional mitigation measures as conditions for approval of the Application for permit to Drill (APD). These measures however, cannot be so restrictive as to preclude the exploration and development of potential mineral resources on the lease. How can we be assured that we won't be precluded from drilling? What if we can't afford mitigation measures?

Response 7.5 - Mitigation measures to prevent unnecessary and undue degradation of public land resources or to preclude violation of Federal laws are routine costs of conducting business on public lands. If you believe the required measures are unduly restrictive, appeal procedures are available to receive a hearing before the Interior Board of Land Appeals.

Comment 7.6 - Page 9, Bonds are also required before geophysical explorations are authorized. This might preclude any extensive geophysical explorations.

Response 7.6 - Bonds are required to ensure the operator's compliance with the terms and conditions, the laws, and regulations applicable to the use authorization. Bonds are required for the protection of the environment and to ensure rehabilitation following authorized activities.

Comments 7.7 - Page 10, who mandates and pays for special management to control total suspended particulates and sulfur oxide emissions in a Class I area as set forth in the Clean Air Act?

Response 7.7 - Special management requirements for Class I areas are established by the Regional Air Quality Control Districts in compliance with Clean Air Act requirements. Project applicants requesting a permit to pollute public air are required to bear the financial burden of reasonable mitigation measures.

Comments 7.8 - Page 11, how can we drill even in currently developed oil and gas fields with the onslaught of Threatened and Endangered Plants and Animals hanging over us?

Response 7.8 - Numerous exploration and development wells, as well as a wide variety of other O&G development activities have been successfully accommodated within endangered species habitat on BLM managed public lands in the Bakersfield District. Industry representatives have worked closely with the Bureau of Land Management, the U. S. Fish & Wildlife Service, the California Department of Fish & Game, and other affected agencies to develop and refine procedures that allow for continuation of O&G activities without jeopardizing the survival of endangered species.

Comment 7.9 - Page 12, do you think an oilfield dominates the view of the casual observer miles from I5? I don't think so.

Response 7.9 - Oilfield development on public lands in the Panoche Hills could be located on highly visible slopes located less than one mile from I-5. Construction of roads, well pads, and other supporting facilities without regard to impacts on visual quality could result in a highly scarred landscape. Fortunately visual scarring of the landscape can be avoided by careful design and siting of facilities.

Comment 7.10 - Page 13, You say that partially in response to declining domestic oil production, there are continuing pressures for increased offshore oil production. What about domestic on-shore production? Let's promote that.

Response 7.10 - The statement is included in the EIS to point out that increased on-shore production could reduce the demand for off-shore production.

Comment 7.11 - Page 15, What if an operator can't afford mitigation for plants and animals for oil and gas exploration?

Response 7.11 - See responses 7.5 and 7.8.

Comment 7.12 - Page 16, What is the time frame to obtain an air quality emission permit for oil and gas exploration and development activities that require off-road vehicle use or surface disturbance?

Response 7.12 - Permits are received from the appropriate Regional Air Quality Control Boards. Air quality permits for drilling exploration or development wells can take from three to six months to complete processing.

Comment 7.13 - Page 17, Why provide an analysis for the potential for use of electric motors in lieu of diesel powered drilling rigs when the electric grid is to far from the location?

Response 7.13 - This stipulation has been dropped since the San Joaquin Valley Unified Air Pollution Control District is currently studying this issue with final implementation rules scheduled for adoption in 1994.

Comment 7.14 - Page 23, Who will pay for air modeling studies? If air quality would be impacted, then the use of electric motors or other nonpolluting technology would be required to minimize emission. What if electric motors are not practical?

Response 7.14 - Completion of appropriate air modelling studies is the responsibility of the project applicant. If electric motors are not practical, then other nonpolluting technology or other measures to prevent degradation of air quality could be used. Other measures include restricting operations during unfavorable weather or pollution dispersion conditions, reducing daily operating hours, eliminating existing pollution sources to establish a pollution credit, etc. The potential need for special management measures would be included as an information notice on the affected leases, so lessees would be aware that special technology or strategies could be required to mitigate potential impacts to air quality within the National Monument. Also see comment 2.5.

Comment 7.15 - Page 32, Air Toxics Hot Spots - SJVUAPCD is mentioned as being the authority but is ignored earlier in text about air regulations.

Response 7.15 - The first sentence in the subsection titled "San Joaquin Valley Air Basin" states "At the present time air quality is managed by the San Joaquin Valley Air Quality Basin Authority."

Comment 7.16 - Page 31, BLM properties are insignificant as far as emissions are concern (less than 1% of total emissions). BLM's contribution to the increase in emissions is projected to be negligible. Why do air modelling studies for BLM properties?

Response 7.16 - Serious air quality deterioration is normally the product of numerous small contributors who individually may seem insignificant, but cumulatively create a significant public health hazard.

Comment 7.17 - Page 69, You mention diesel engines currently dominate the San Joaquin Valley oil fields. Only drilling rigs and pulling rigs, which are portable sources, use diesel engines. Most production facilities are run by electricity or natural gas which have little or no emission impact.

Response 7.17 - The language in the Final EIS has been corrected. Many diesel engines used in oil & gas production have been eliminated in recent years. In particular, the O&G industry working in cooperation with the BLM, has recently substituted natural gas for many diesel operated engines used for San Joaquin Valley steam enhancement operations.

Comment 7.18 - Page 70, You state that sumps only account for about 4% of the ROG emissions - Why bother to mitigate sumps?

Response 7.18 - Studies indicate this is a feasible and cost effective method to reduce ROG emissions (see MBUAPCD 1989). Also see response 7.16.

COMMENT LETTER #8
DEPARTMENT OF FISH AND GAME
REGION 4
1234 EAST SHAW AVENUE
FRESNO, CALIFORNIA 93710

Comment 8.1 - In general, we encourage other agencies to provide the greatest protection possible to sensitive wildlife, plants, and their habitats. Although the document delineates threatened and endangered plant and animal habitat within the resource area, no distinction has been made regarding element occurrence or habitat suitability within those areas. We strongly recommend that sensitive species inventories be completed prior to any new exploration or development.

Response 8.1 - The special Endangered Species Stipulation (see Appendix E in the Final EIS) requires inventory and habitat evaluations before surface occupancy is authorized within T&E species habitats.

Comment 8.2 - We recommend the BLM give consideration to the core habitat areas and conservation strategies advanced by SJVBTC in this current planning effort. It may be

necessary to significantly restrict oil and gas development within core habitat areas in order to meet species recovery goals. This type of protective program is best implemented at the area planning level, rather than on a lease-by-lease basis.

Response 8.2 - The San Joaquin Valley Biological Technical Committee (SJVBTC) has identified the Panoche/Tumey Hills as a core habitat area. The BLM is proposing to limit surface disturbance in these areas to 10% of lease acreage. This is consistent with SJVBTC recommendations which were based on studies that indicate this level of disturbance is compatible with maintenance of high quality habitat for the target species (SJVBTC 1993).

Comment 8.3 - Many of the sensitive species discussed in the Environmental Impact Statement (EIS) are listed as threatened or endangered by both the federal and state governments. The document fails to discuss compliance with the California Endangered Species Act (CESA) for projects impacting state-listed species. Individual oil and gas developers, whose activities have the potential to result in take of state-listed threatened or endangered species, must initiate consultation with the DFG and formally request an Endangered Species Management Permit pursuant to Section 2081 of the CESA. To avoid project delays and conflicting take avoidance and/or mitigation measures, we recommend that the BLM develop a standardized process for reviewing the potential impacts of oil and gas development on sensitive species that incorporates a joint consultation with the DFG.

Response 8.3 - The BLM concurs that a joint federal-state endangered species act(s) consultation process is desirable. Section 2095 of the California Endangered Species Act (CESA) provides legal guidance for these situations. We will be working with the U. S. Fish & Wildlife Service and the California Department of Fish and Game to develop a process for efficient implementation of cooperative procedures per Section 2095 of the CESA.

Comment 8.4 - The DFG and the USFWS typically consider that a 3:1 habitat acreage compensation ratio is acceptable for the San Joaquin Valley projects which result in the loss of threatened and endangered species habitat. The DFG and the USFWS also accept a reduced compensation ration of 1.1:1 for temporary impacts, such as installation of underground pipelines where the surface is immediately restored after construction. The document states that, under the preferred alternative, the loss of sensitive species habitat should be compensated off-site either through direct acquisition and/or improvement of other habitat areas. The document fails to specify compensation ratios. We recommend that the current standard ratios be adopted as the compensation required for oil and gas development in the Hollister resource area.

Response 8.4 - The 3:1 and 1.1:1 ratios are currently being used for most San Joaquin Valley federal and state biological opinions. The appropriate ratio suitable for a particular project could, however, be dependent on a number of factors including amount of disturbance on project site, impacts of project development on adjacent habitat lands, growth inducing effects of the project, quality of habitat disturbed, and amount of existing habitat disturbance on the project site. Establishing a fixed habitat compensation ratio in this document would eliminate

all flexibility to adjust compensation ratios based on site-specific evaluations, and to incorporate new technical and scientific data in the refinement of appropriate compensation ratios. Rather than establish a fixed compensation ratio, the BLM would prefer to maintain the flexibility to continue to refine appropriate mitigation measures, including compensation ratios, in consultation with the U. S. Fish & Wildlife Service and the California Department of Fish & Game.

Comment 8.5 - In order for projects to receive Section 2081 permits, pursuant to CESA, the DFG will expect compensation lands to be permanently protected and managed for the benefit of the listed species. Management for the benefit of threatened and endangered species may require restrictions of other uses often associated with public lands such as off-road vehicles, oil and gas development, mining, camping, and grazing. Assurance must be provided to the DFG that endangered species compensation habitat will be adequately protected, as a part of the DFG's permit issuance.

Response 8.5 - The BLM concurs with your comment.

Comment 8.6 - The document does not address the use of rodenticides in association with oil and gas development. The use of rodenticides will reduce prey species for the San Joaquin kit fox, as well as result in the direct take of listed rodents such as the kangaroo rat. Some rodenticides also contain attractants that have been known to cause kit foxes to eat it. We recommend that all use of rodenticides be prohibited in endangered species habitat areas.

Response 8.6 - Restricting the use of rodenticides within these habitat areas is current BLM policy.

Comment 8.7 - Many areas of the San Joaquin Valley are subject to invasion by vigorous nonnative plant species after ground disturbing activities. Invasion by undesirable vegetation can lead to the use of herbicides and pesticides. One such species, Russian thistle (Salsola kali), is a house plant for the beet leaf hopper, which is controlled by aerial pesticides spraying. This spraying kills all insect life which may, in turn, have detrimental effects on blunt-nosed leopard lizards which forage heavily on insects. Measures should be implemented during operation and habitat restoration to control invasive nonnative vegetation. The use of herbicides in oil and gas development areas can be an effective tool but should be carefully controlled, so as to not impact adjacent endangered plants or habitat for endangered animals.

Response 8.7 - The BLM recently finalized an Environmental Impact Statement on Vegetative Management in California (USDI 1988). This document established procedures for authorizing and implementing vegetation manipulation practices, including the use of herbicides and pesticides on public lands in California. An additional site specific Environmental Assessment would be completed prior to authorizing any specific project. The EIS concluded that impacts to T&E species would be identified and avoided in concert with development of the site specific Environmental Assessments.

Comment 8.8 - Page 26 - The information in the "Threshold" column of Table 1 is confusing. Under "Special Status Plants," the threshold for renewed consultation with the USFWS is the loss of 400 acres of habitat. Our knowledge of many of the listed plants is quite limited, and the loss of 40 acres of one plant's habitat could virtually eliminate that species. The threshold acreage for both "Special Status Plants and Animals" seems to high. Conversely, under "Wildlife," the threshold for a complete new environmental assessment is the loss of 400 acres of habitat, which seems too low. Perhaps these figures should be reversed.

Response 8.8 - These thresholds are based on 80% of the impacts anticipated to occur in the EIS. The EIS projects that 505 acres could be permanently disturbed as a result of new oil & gas field development activity. This anticipated level of oil & gas exploration and development activity is based on the best currently available scientific and market information. This projection or assumption forms the basis for the impact assessment in Chapter 4. The purpose of establishing this threshold is to assure that if this assumption is in error, then a new environmental analysis would be conducted before additional unanticipated cumulative environmental impacts resulted from continued O&G leasing. Please note that while the threshold would allow up to 400 acres of habitat disturbance, additional thresholds would require new T&E mitigation measures if there was "any damage to occupied habitats or reduction in population size attributable to human disturbance." Also note that all proposed surface disturbing activities would be subject to T&E inventory requirements and subsequent site-specific Section 7 Endangered Species Act consultation if impacts to T&E species could not be avoided.

Comment 8.9 - Page 35 - Table 3 should be amended to include a column for the state-listing status.

Page 45 - Table 5 should be amended to include a column for the state-listing status.

Page 46 and 47 - Table 6 should be amended to include a column for the state - listing status.

Response 8.9 - The tables have been revised in the Final EIS to include a column for the state-listed status.

Comment 8.10 - The document states that abandoned well sites may be used as compensation for impacts if "successful recolonization" by foxes occurs. Since this type of factor is quite difficult to assess due to the nomadic lifestyle of kit foxes, we recommend that the BLM choose measurable vegetative characteristics and presence of prey species as the criteria for determining if suitable habitat for kit foxes has been reestablished.

Response 8.10 - The Final EIS has been changed to incorporate this comment.

Comment 8.11 - The San Joaquin kit fox survey methodology developed by the DFG is only intended to determine presence of foxes. The methodology would need to be modified, if it is used for monitoring impacts to kit fox populations due to incremental development.

Response 8.11 - The Final EIS has been changed to incorporate this comment.

Comment 8.12 - Page 86 - Mitigation measures for giant kangaroo rat - The document correctly portrays the rarity of this species. Giant kangaroo rats seem to be less able to adapt to changing environmental factors than the other listed kangaroo rats. This sensitivity calls for the strictest protective measures. We recommend that all areas occupied by giant kangaroo rats, and the areas between precincts, be off-limits to oil and gas development. For example, if precincts were separated by more than 400 feet with suitable habitat between, the EIS would permit oil and gas development to occur between the precincts, effectively eliminating a movement corridor and potential precinct area. We also recommend a minimum 1/4 mile buffer zone around these areas. In addition, all rodenticide use should be prohibited within 1/4 mile of known precincts.

Response 8.12 - The BLM does not believe that limited pad and road construction would eliminate movement between precincts or restrict immigration or dispersal. The anticipated level of activity would not create a notable fragmentation effect. In the Carrizo Plains Natural Area, it appears that roads may be used as movement and dispersal routes in very dense cover. The risks of vehicle collisions should be minimal due to the nocturnal behavior of the giant kangaroo rats and the daytime industry activities. Restricting the use of rodenticides in T&E habitat is current BLM policy.

Comment 8.13 - Monitoring - The document states that annual monitoring will be conducted to assess the number of acres of habitat disturbed and the status of known populations of sensitive plants and animals in or near oil activities. The methods for assessing plant and animal populations should be detailed in the environmental document and circulated for agency review prior to approval. Many of the mitigation measures designed to avoid take of listed species most also be monitored during exploration, construction, and operation. The document fails to address how mitigation monitoring will be accomplished. The document should identify who will be responsible for monitoring, how often site visits will occur, what type of reporting system will be implemented, how noncompliance will be corrected, and how the monitoring information will be conveyed to other concerned agencies. We recommend that adequate funds be provided by oil and gas lessees to pay for all monitoring activities.

Response 8.13 - The discussion on monitoring that concludes Chapter Two of the Final EIS has been expanded in response to your comment.

COMMENT LETTER #9
MONTEREY PENINSULA REGIONAL
PARK DISTRICT
P.O.BOX 935
CARMEL VALLEY, CALIFORNIA 93924

There were no substantive comments requiring a response.

COMMENT LETTER #10
WESTERN STATE PETROLEUM ASSOCIATION
901 TOWER WAY, SUITE 300
BAKERSFIELD, CALIFORNIA 93309

Comment 10.1 - A 1992 WSPA regulatory analysis prepared by the Environ Corporation revealed that California oil and gas activities must comply with over one hundred regulations and reporting requirements enacted with the intent to ensure that energy development and production are conducted in an environmentally sound manner. It should also be recognized that oil and gas production results in significant socioeconomic benefits to the State of California. These benefits, which should clearly be discussed in the leasing analysis, are provided through taxes, royalties, lease rentals and employment and must not be ignored, especially in recessionary times. WSPA would welcome the opportunity to provide information to the BLM which would address the socioeconomic benefits provided through oil and gas production. We believe the federal government has an obligation to the State and its residents to facilitate oil and gas activities to the greatest extent possible.

Response 10.1 - Drilling crews operating in the Hollister Resource Area generally are based in Kern County. During the past five years there has been an average of about one wildcat exploration well drilled each year on public lands in the Hollister Resource Area. Most oil field maintenance crews are located in the Coalinga area. No major changes in drilling, production, or exploration activity rates are projected over the plan life. The probability of a new field discovery on public lands in the Hollister Resource Area over the plan life (15 years) is less than 5%. Even if a discovery did occur, it would probably represent only 0.003% to 0.017% of known California reserves of 5.9 billion barrels. Therefore, no significant changes are expected for the local economies, job bases, or other socio-economic factors (Milliken 1990c and 1990d).

Comment 10.2 - WSPA believes that the array of alternatives considered by the BLM in the leasing amendment analysis is inadequate. A definite bias toward highly restrictive management in the Resource Area is evident from the limited range of alternatives contained in the DEIS. The alternatives range from no leasing at all to leasing with highly restrictive stipulations. The National Environmental Policy Act (NEPA) explicitly requires the analysis to have a reasonably balanced selection of alternatives from which to derive a preferred alternative.

In order to achieve a balanced analysis, the BLM should include in the Final EIS (FEIS) an alternative which allows leasing on the entire Resource Area, excluding designated wilderness or other legally withdrawn areas, with standard lease terms and conditions. Such an alternative is vital because it provides the public with a baseline for comparison of the BLM's management objectives by alternative, not only in terms of related environmental consequences, but also in terms of BLM's authority to protect sensitive resource values in the absence of special stipulations and conditions. Additionally, analysis of such an alternative would help BLM staff understand what level of restriction is justifiable for a specific resource or a given area based upon scientific analysis.

Response 10.2 - The BLM believes the Draft EIS provides an adequate range of alternatives. Alternative "A" allows leasing with no major constraints on all areas with potential for discovery of oil & gas resources.

Comment 10.3 - A critically important element of analysis is missing in the DEIS -- provision of adequate justification for the BLM's proposed decisions, i.e., not to lease in certain areas or to impose highly restrictive no surface occupancy stipulations in others. For example, the mere premise that Squaw Leap, the California Coastal Zone, and the Carmel River watershed have no known potential for oil and gas is not justification to withhold them from oil and gas leasing. Even though these areas may contain sensitive resources, such as eagle winter habitat or visual quality, there is no discussion that less restrictive measures (such as seasonal restriction) were shown to be incapable of protecting these resources. Clear and concise justification of all decisions is mandated by NEPA, the BLM manual, and BLM policies.

Response 10.3 - The rationale for identification of Alternative "D" as the "Preferred Alternative" was discussed on page 22 of the Draft EIS. This discussion has been expanded in the Final EIS. The decision not to identify Squaw Leap, the California Coastal Zone, and the Carmel River watershed for leasing at this time was fully scoped during scoping for the Draft EIS. Industry representatives concurred that these areas have no potential for oil & gas discovery and that detailed environmental analysis of hypothetical oil & gas field development would not be a productive exercise. At a meeting with O&G industry representatives held subsequent to publication of the Draft EIS, industry representatives again concurred that these areas have no oil & gas potential. Proposing hypothetical oil & gas field development within these areas which have no potential for development would only serve to unduly alarm the public and would not be beneficial to the Bureau or the O&G industry.

If industry representatives wish to identify these areas as candidates for leasing, the BLM will consider establishing a separate public scoping and environmental analysis procedure which will focus specifically on these individual areas.

Comment 10.4 - There is no justification provided for the proposed imposition of non-waivable no surface occupancy (NSO) stipulations around Pinnacles National Monument to protect the foreground viewshed. According to the DEIS, this area is classified as Visual

Resources Management (VRM) Class II, which requires that any "changes must repeat the basic elements of form, line, color and texture found in the predominant natural features of the area" and VRM Class III, which allows that "management activities may attract attention but should not dominate the view of the casual observer". The fact that the surrounding landscape consists of rugged chaparral covered slopes in the Gabilan Mountain Range is a good indication that the area contains many opportunities for reasonable mitigation, such as screening of operations, without resorting to NSO. Again, the BLM has not shown that less restrictive measures were inadequate to protect, in this case, the visual resource.

Response 10.4 - The areas identified for the NSO restriction are steep slopes that are readily visible from the National Monument's heavily used trail and road access system. Visual resource mitigation techniques were reviewed and no feasible methods were identified that would preclude degradation of scenic quality on public lands as viewed by the monument's visitors. Also see response 1.1 and 6.2.

Comment 10.5 - The proposed use of a nonwaivable NSO stipulation on public lands is of grave concern. Not only is it unclear whether such a restriction would also eliminate the possibility of exceptions to or modifications of lease stipulations, it is inconsistent with direction contained in 43 CFR Section 3101.1-4, which directs:

> "A stipulation included in an oil and gas lease shall be subject to modification or waiver only if the authorizedofficer determines that the factors leading to its inclusion in the lease have changed sufficiently to make the protection provided by the stipulation no longer justified or if proposed operations would not cause unacceptable impacts."

The SPG state the following with regard to stipulation waivers:

> "In accordance with BLM Manual Section 3101, stipulations are to include a provision for waiver. The RMP should describe the circumstances within which waivers would be considered. The RMP should also identify any stipulations that will not be waived without further pubic review."

The intent of the regulations and manual is clear -- the BLM should retain the management flexibility to consider stipulation waivers. It is important to maintain the option of case-by-case, site-specific consideration of waivers, exceptions, or modification to lease stipulations. Removal of such discretion would deny industry the opportunity to utilize state-of-the-art technologies which could offer adequate mitigation of impacts. Therefore, we encourage the BLM to not only reconsider its broad use of NSO surrounding the Pinnacles National Monument, we also urge the BLM to eliminate entirely its proposed use of non-waivable NSO to achieve consistency with the BLM's regulations and manual.

Response 10.5 - The NSO has been altered in the Final EIS to provide conditions for waiving the stipulation. These conditions would require that a new environmental analysis be conducted to supersede the analysis in this EIS, and that a waiver would be considered a substantial modification of the lease subject to the public review provisions of CFR 3101.1-4.

Comment 10.6 - The creation of a "conditional" NSO stipulation is also without merit. The Uniform Format for Oil and Gas Lease Stipulations was adopted Bureau-wide in 1989 as a means to eliminate a wide range of inconsistencies and variations in the application of lease stipulations and notices among the various offices of federal land management agencies. WSPA encourages the BLM to remain consistent with this direction which does not include any guidance for attaching conditions to lease stipulations. We strongly recommend, however, that BLM take specific care in the wording of all stipulations, including NSO and timing stipulations, to ensure that they are enforceable only when the resources they are meant to protect are present in the area of proposed activity. If such resource values are not found, the stipulation should not apply. This approach would eliminate the perceived need for a "conditional" stipulation as well as the need for a waiver, modification or exception to the stipulation.

Response 10.6 - see response 6.1.

Comment 10.7 - WSPA disagrees with the BLM's position that it is necessary to apply severe constraints on oil and gas leases in order to protect T&E species and their habitat. The BLM must recognize that Section 6 of standard federal lease form provides full protection of T&E species and designated critical habitat. Coupled with the Endangered Species Act (ESA) requirements for a section 7 consultation prior to approval of any activity which could adversely impact T&E species or critical habitat, legally binding protection of T&E species and habitat is clearly already mandated. Therefore, only a lease notice is necessary to inform the lessee that a potential conflict may exist on the leasehold; special stipulations are not required.

Response 10.7 - The use of an Endangered Species Stipulation clearly establishes that when protection of a cited species conflicts with exploration or development of the lease, then protection of the species shall prevail. It avoids future discussion of how "lease rights" are affected by T&E mitigation or any future discussion of compensation of lessees if leases cannot be economically developed. The use of the stipulation also is a strong message notifying the potential lessee that special restrictions could apply to proposed actions on the lease, assuring that all bidders are fully aware of encumbrances that could affect the level and intensity of future operations on the lease.

Comment 10.8 - The BLM's proposal to impose severe lease constraints in areas with "potential" T&E habitat, whether through NSO or other equally severe restrictions, is unwarranted. All critical habitat should have already been delineated in accordance with a 1982 ESA amendment which requires the federal government to designate the critical

habitat of protected species within twelve to eighteen months of listing. It could be said that if no habitat has been identified within this legally established time frame, none exists; and, therefore, none should be protected. While WSPA does not endorse this position, we do believe the BLM and the U.S. Fish and Wildlife Service should be held accountable for continual delays of critical habitat designations. Lack of agency accountability has resulted in unrelieved delays in on-going oil and gas activities. Moreover, we believe that the Department of the Interior's practice of routinely expecting the oil and gas industry to incur expenses that are the responsibility of managing agencies is unlawful and unethical and should be abandoned. WSPA urges the BLM to work with the Fish and Wildlife Service to develop an accelerated schedule to complete these surveys without further delay. WSPA would welcome the opportunity to assist the agencies in this effort.

Response 10.8 - The U. S. Fish & Wildlife Service has the responsibility for designation of critical habitat. Since 1991 the BLM has completed inventories for rare plant species on 31,000 acres in the Hollister Resource Area. The top priority for initial inventories were areas with a high potential for O&G development. These inventories have now been completed for all areas that have high O&G development potential.

Comment 10.9 - WSPA requests that BLM consider incorporating flexibility into the RMP mitigation measure analysis to address permitting delays (e.g. pp. 11, paragraph 4, and pages 76 and 84). WSPA is identifying a number of examples of flexible mitigation strategies during the current development of the Kern County Habitat Conservation Plan (HCP) including fees for offsite land purchase or enhancement, conservation easements, management agreements, flat fee rates for base level activities (i.e. pay per well fees), credits for restoration/revegetation for use as offsets, land donations, and offsite purchases. Mitigation measure flexibility should be consistent between RMP processes for state regions and state and local habitat planning efforts. Such consistency would also support state and federal permit streamlining objectives.

As an example, in regard to compensation land as a mitigation alternative, WSPA requests that BLM consider the following language change to Alternative D, item B, page 23: "Permanent destruction of known T&E plant habitat may be offset through the acquisition and transfer to the BLM of comparable offsite habitat (compensation land). This alternative would enable a project to proceed without extensive permitting delays. This is not to say that additional language could be incorporated to address other mitigation options.

One specific example of mitigation flexibility is provision of suitable offsite habitat to compensate for disturbance of known threatened or endangered species habitat. This approach may eliminate the need to impose mitigation requirements in a "patchwork" manner within heavily developed oil fields. Such a prearranged compensation process could be offered as an option to the section 7 permit process which often involves significant delays due to the supposed lack of available scientific data.

Response 10.9 - The BLM supports the concept of identifying suitable off-site habitat areas where mitigation lands could be purchased, and supports the concept of placing mitigation funds in trust status until suitable lands are available for purchase. In response to your comment, the language of the mitigation measure (Alternative D, Item B, page 23 of the Draft EIS) has been changed in the Final EIS to clarify that land acquisition funding could be provided in lieu of actual land.

Comment 10.10 - WSPA is further concerned with the Alternative D mitigation discussion on page 76 which includes the term "potential habitat". It should be noted that potential habitat, by definition, has not been subjected to a scientific analysis to determine its suitability to support a species. This term provides the BLM discretion to delay a decision for lack of adequate data. In the absence of appropriate data, a project applicant may face considerable delays. It is critical that sensitive habitat designations are based on available data.

Response 10.10 - Potential as used in this context was intended to be synonymous with unoccupied habitat, i.e. habitat that was suitable for these species but was not currently known to be occupied by actual populations of the protected species. In the Final EIS the term "potential" has been dropped to eliminate confusion over use of this term.

Comment 10.11 - WSPA requests that BLM clarify the basis for designating a T&E animal habitat limitation to one pad per 40 acres under Alternative D, item D, page 23. WSPA understands that other ratios much lower than 40 acres have been considered. We suggest the following language change: "Development of new O&G fields in <u>known</u> T&E animal habitat would be limited to <u>a well pad-per-acreage ratio, contingent upon the presence and compatibility of T&E species, and unless additional development is offset by other mitigation strategies.</u>

Response 10.11 - The intent of the limitation was to assure that O&G development activities did not proliferate to the point that T&E habitat suitability was compromised. Studies have indicated that maintenance of high quality T&E habitat for the targeted species is compatible with limited development. In response to this comment and subsequent meetings held with industry representatives, the mitigation measure has been changed in the Final EIS to a restriction that no more than 10% of the habitat within a lease can be disturbed by leasing activities. This provides the same level of protection that the pad per acre limitation would have provided, but gives the industry additional flexibility in determining how to limit overall disturbance within the habitat areas.

Comment 10.12 - WSPA also requests that the word "impacts" on page 15, paragraph 1, line 9 should be preceded by the word "permanent". The RMP must convey the fact that some disturbances are temporary (e.g. seismic). Mitigation measures should not be required for the majority of temporary disturbances.

Response 10.12 - The Draft EIS recognized the very limited impact frequently associated with seismic exploration on page 64 where this activity is described as a "very transitory

disturbance." The purpose of mitigation is to avoid and/or minimize impacts to the targeted species. The BLM supports the concept that mitigation and/or compensation should be commensurate with the intensity and duration of the projected impact. Nevertheless, any potential adverse impact, however transitory, warrants the application of appropriate mitigation.

Comment 10.13 - Where offsite mitigation is not an option, WSPA would like to note that oil and gas activities coexist with a variety of species. The BLM states in the DEIS that oil and gas fields support several T&E species, such as the blunt nosed leopard lizard, giant kangaroo rat, and the kit fox. It is also suspected that they may support the San Joaquin antelope squirrel, short nosed kangaroo rat, San Joaquin pocket mouse, and five rare beetles. It should be noted that through development and implementation of habitat conservation plans (HCP), oil and gas companies have employed mitigation measures which have proven successful in protecting impacted species. The persistence of this species in oil and gas fields must to a degree reflect industry compliance with T&E mandates and the fact that these purported conflicting interests must be somewhat compatible.

Response 10.13 - The impact analysis in the Draft EIS acknowledges that low to moderate levels of oil field activity appear to be compatible with preservation of the targeted T&E species. Federal and State wildlife agencies responsible for management of endangered species have adopted a policy of "no net loss" of habitat for T&E species native to the San Joaquin Valley. This policy has been adopted because 93% of the habitat for these species has already been destroyed, and projections are that at current rates of development, all habitat on private lands could be destroyed by 1996. The BLM supports this position and believes that compensation is appropriate when any of the remaining habitat supporting these rare species is destroyed.

Comment 10.14 - The BLM indicates that most new exploration and development activities will take place in currently producing fields. In fact, BLM predicts that as many as 225 federal wells and up to 4,000 private wells will be drilled in the Hollister Resource Area over the next 15-years. WSPA would like to note that cumulative impacts of such activity would be much less significant than these numbers might otherwise imply due to dry holes and concurrent reclamation activities. Consequently, we must strongly oppose any plans to reintroduce any special status or listed species in the developed fields because they <u>are</u> heavily developed. WSPA believes that compounding the numerous existing regulatory and procedural burdens imposed on the oil and gas industry based on subjective growth projections is entirely inappropriate. The time to consider reintroducing additional species into these areas would be when the fields are depleted and scheduled for plugging, abandonment, and reclamation. At that time, there would be far fewer potential conflicts between classified species and production activities.

Response 10.14 - Table #9 (Summation of Affected Acres) in the Draft EIS was designed to emphasize the relationship between temporary impacts, new long-term development, reclaimed abandonments, and **net long-term disturbance**. It was not the intent of the Draft

EIS to suggest that special status species should be reintroduced into the midst of the developed fields. We do believe that site-specific conditions for well abandonment operations should give priority to maintaining or establishing habitat for these species within their historic range. We agree that the appropriate time to reintroduce species to the oil fields is in concert with field abandonment, and we are anxious to develop comprehensive abandonment goals and plans for fields that are becoming depleted.

Comment 10.15 - Off-site mitigation requirements must be limited to known critical T&E habitat. The Santa Lucia deer herd is not comprised of threatened or endangered species. While companies would likely be willing to seasonally mitigate any impacts, there has been no justification offered for acre-for-acre off-site mitigation. The DEIS indicates the Santa Lucia deer habitat is in poor condition due to fire suppression and other management policies, not because of oil and gas activities. Instead of penalizing the oil and gas industry for agency mismanagement of the herd's habitat requirements, other means aimed at improving the existing habitat should be the BLM's priority management objective for this area.

Response 10.15 - The proposed off-site mitigation for impacts to the Santa Lucia deer herd would only occur if a new oil field were discovered resulting in long-term loss of habitat. The suggested off-site mitigation did not require acquisition of land, but only limited funding for controlled burns to create new habitat in existing over-mature brush fields on other federal lands in the vicinity.

Comment 10.16 - BLM discussions relative to oil and gas development impacts on air quality concerns do not clearly define the source categories to which emissions data are ascribed in the RMP. For example, the DEIS states on page 68 that since 1979, ROG emission (source unspecified) in the San Joaquin Valley have dropped 30 percent. It is unclear whether this figure applies to cumulative Valley emission sources or only to oil and gas sources. The BLM credits this decrease in emissions to an increase in stringent emission controls on oil and gas production. If BLM intends to credit recent reductions in cumulative emissions entirely to oil and gas source controls, WSPA would like to note that oil and gas operations can only be considered as one component of a complex emissions inventory which includes mobile source and agriculture emissions. WSPA requests that BLM clarify the application of this citation.

Response 10.16 - The information cited above is from the publication titled "San Joaquin Valley Growth and Air Quality Impacts; Technical Support Document" published by the California Air Resources Board in 1988. The decline in ROG emissions was for all sources. The Draft EIS did not "credit recent reductions in cumulative emissions entirely to oil and gas source controls." The Draft EIS stated "The imposition of more stringent controls on oil & gas production emissions is considered one of the major factors responsible for this reduction in ROG emissions." This is consistent with the cited reference.

Comment 10.17 - BLM raises a concern on page 71 regarding possible impacts of oil and gas activities on two Class I air quality management areas -- specifically, the Ventana

Wilderness and Pinnacles National Monument. It is stated that emissions from exploratory wells on adjacent or nearby lands could cause temporary impacts to air quality in these areas by increasing the emissions of ozone generating compounds and particulates and that long-term degradation of air quality could result from development of a new oil or gas field. However, in the very next paragraph on the same page, the BLM points out that a comparison of predominant wind patterns on BLM lands where oil and gas exploration could occur indicates very little chance that activities would affect air quality in the Ventana Wilderness. Therefore, it is unclear why the BLM would raise the issue in this manner.

Response 10.17 - The BLM addressed potential impacts to the Ventana Wilderness to document that these impacts had been considered and dismissed based on evaluation of predominant wind patterns. This is appropriate so that reviewers are aware that the potential impact was not overlooked.

Comment 10.18 - While the BLM suggests that oil and gas activity could have a negative impact on air quality in the Pinnacles National Monument, no specific data is offered to substantiate this conclusion. In order to put the issue in proper perspective, it would be helpful for the BLM to attempt to quantify these potential impacts so their significance can be determined. With this type of information, it can be ascertained whether adequate mitigation to reduce or eliminate the potential impact is available.

Response 10.18 - It would be difficult to quantify any potential impact without specific information on the location and type of emission source. The purpose of the modelling is to assure this site-specific information is gathered prior to any proposed emissions. The modelling is already required by the Monterey Bay Unified Air Pollution Control District's Rule 207. The purpose of including it as a BLM stipulation is to assure that lessees are aware of these special requirements when they bid on a prospective lease. Also see comment 2.5.

Comment 10.19 - Overall, the mitigation measures proposed by the BLM in Chapter 4 to protect air quality are unnecessary given comprehensive existing state and federal level air quality programs. A highly complex regulatory system is currently in place in California to assure that emission reductions are achieved in the most expeditious manner possible by application of innovative policies and procedures and state-of-the-art control technology. Given increasing regulatory overlap at the local, state and federal levels, WSPA does not believe that the BLM needs to seek a lead role in air permitting programs. If BLM's intention is to develop an additional air permitting structure, WSPA requests that BLM prepare a complete analysis of the existing regulatory structure which identifies the roles, requirements, and regulatory authority to which the oil and gas industry is subject. WSPA believes that BLM will find that additional requirements would only serve to complicate the complex existing structure with minimal additional environmental benefit (if any). WSPA would welcome the opportunity to discuss our findings on this subject with BLM staff.

Response 10.19 - It is not the intent of the BLM to establish an additional air permitting structure, but rather to clearly and unequivocally support the efforts of the Regional Air Quality Control Boards. In the Final EIS several of the air quality mitigation measures have been dropped to avoid the appearance of duplication with requirements of the Air Quality Control Boards. These mitigation measures are now discussed in Chapter 4 with clarification that application and enforcement is the responsibility of the Regional Air Quality Control Boards.

Comment 10.20 - BLM's proposal to require industry to substitute electric or gas engines for diesel engines in new or existing fields in the San Joaquin Valley is nothing short of arbitrary and capricious. Consideration of environmental benefits notwithstanding, there does not seem to have been any serious consideration of the electrical power requirements such a conversion would demand. Nor does it appear to have been considered that the large financial burden of converting from diesel to electric or gas engines would likely render many producing operations economically infeasible, particularly those which are nearing depletion. Again, WSPA would like to emphasize that the BLM proposal to consider instituting an air quality permitting program is entirely unnecessary and unwarranted and is clearly beyond the BLM's purview.

Response 10.20 - The BLM has made no proposal to require conversion of diesel engines to electric or gas engines. The BLM has suggested that an analysis of the potential to use electric or gas engines should be conducted prior to the approval of new APDs. A review of recent air permits for APDs in the Hollister Resource Area indicates that this analysis is already being required by the Regional Air Pollution Control Districts. In the Final EIS this mitigation measure has been dropped in deference to the San Joaquin Valley Unified Air Pollution Control District which is currently studying this issue with final implementation rules scheduled for adoption in 1994 (SJVUAPCD 1992).

Comment 10.21 - State law already mandates "no net increase" provisions for nonattainment pollutant emissions. The BLM should not interfere in matters of state and local jurisdiction such as air quality regulations. Industry should not be made accountable to yet another regulatory agency which does not have the regulatory authority, the technical expertise, or the physical resources to decide how best to comply with federal, state, or local air quality regulations.

Response 10.21 - See response 10.19 and 10.20.

Comment 10.22 - BLM's Reasonably Foreseeable Development (RFD) well and impact figures are inconsistent throughout the document. In some sections, it is stated that as many as 205 wells could be drilled on federal lands while in others it is stated that up to 225 wells may be drilled. A good example can be found on page 67, where in two consecutive paragraphs it is stated that 205 wells will be drilled, then 225 wells. In some cases, it is estimated that a total of 600 acres could be disturbed on a long-term basis and in others, it is stated that 1,000 acres or more could be disturbed, all with the same well count. Of

course, the important point is the net surface disturbance rather than the initial disturbance. WSPA understands that these figures are merely estimates, however we believe that BLM should qualify speculative data in a more appropriate context. For instance, BLM could use a range of numbers for anticipated wells together with a range of net acres to be potentially disturbed. Such an approach should eliminate confusing inconsistencies.

Response 10.22 - The 205 wells were only exploration and development wells, while the 225 figure included the 20 injection wells. This difference has been clarified in the Final EIS. Table #9 in the Draft and Final EIS provides our best estimate of acres that would be disturbed. Please note that we have separated temporary and long-term disturbance, and have accounted for anticipated reclaimed acres to determine a **net long-term disturbance**. The 1,000 acre figure cited in your comment are the total acres expected to be disturbed by long-term and temporary disturbances within the entire resource area. The 600 acre figure includes only those acres that would be severely disturbed (i.e. vegetation removed with landform probably altered by grading) within the existing oil fields.

Comment 10.23 - We strongly suggest that the existing BLM/DOG Oil and Gas Work Group, which has been established out of the BLM District office in Bakersfield, or a similar group, provide a forum for a meeting to discuss specific concerns and language changes to both the RMP and the EIS amendment prior to the close of the public comment period. We are optimistic that these comments will prove useful to the BLM in their effort to develop a reasonable leasing program.

Response 10.23 - In response to your suggestion, the BLM met with industry representatives at the Harris Ranch near Coalinga on March 9, 1993 to discuss industry concerns with the Draft EIS. We believe the meeting was very productive and many changes made in the Final EIS are a direct outgrowth of this session.

COMMENT LETTER #11
PATRIOT RESOURCES
P.O.BOX 40548
BAKERSFIELD, CALIFORNIA 93304

Comment 11.1 - A. Page 69. It is stated that "diesel engines currently dominate the San Joaquin Valley oil fields" --this is not factual as natural gas engines are by far the more common. These natural gas fueled engines create limited emissions and, in fact, are currently being touted as an "environmental improvement" when used in mobile sources.

Response 11.1 - see response 7.17.

Comment 11.2 - B. Page 69 and 70. The major hindrance preventing the conversion of new wells to electric power is the lack of transmission lines. The major hindrance preventing the conversion of natural gas engines to electric power is the ongoing high cost of electricity

compared to, usually self produced, natural gas. This cost, alone, in many cases is catastrophic. It would require that oil fields be abandoned prematurely.

Response 11.2 - see responses 7.13 and 10.20.

Comment 11.3 - Also, 64% of nitrogen oxide emissions are emitted by mobile sources compared to the 50% you reported. It should be noted, likewise, that almost all of the nitrogen oxide attributable to oil and gas operations is in the San Ardo field and due to steam generator combustion sources. Using this data, any extrapolation you do concerning potential oil and gas nitrogen oxide emissions assumes that they will come from a thermally enhanced method of operation. This is the worst case, and not the expected case. Forecast emissions should be based on data more representative of a mix of operations.

Response 11.3 - The 50% figure is for on-road motorized vehicles while the 64% figure you cite is for all mobile sources (MBUAPCD 1989). The narrative in the Final EIS has been changed to clarify that the 50% figure only includes on-road motorized vehicles. We were not aware of the potential discrepancy in our projection of nitrogen oxide emissions caused by the prevalence of stream generator combustion sources. Information from your comment has been added to the Final EIS to place the figures in perspective.

Comment 11.4 - D. Page 17, item B) at the top of the page, BACT, in many circumstances, is too onerous for a specific application. The BACT criteria that has been developed by EPA and, in California, by CARB is too general. It does not consider each specific situation. For example, BACT for a natural gas fueled engine is the retrofit with catalytic converters. This technology works where an engine is constantly loaded, but does not work where an engine is installed on a pumping unit and is cyclically loaded. The definition of BACT does not recognize this situation.

Response 11.4 - The BACT criteria are established by the EPA and the CARB. The Regional Air Quality Control Boards currently require application of BACT control measures for permitted actions that exceed established thresholds. This stipulation has been dropped in the Final EIS since it duplicates procedures already required by the Regional Air Quality Control Boards.

Comment 11.5 - A. On page 93 you state that "Environmental constraints on oil and gas exploration are not expected to affect the level of exploratory drilling activity." This is absolutely false. The restrictions you place in this study will greatly affect the level of drilling activity. Recognize the source of this statement--an oil and gas operator intimately familiar with the risks, rewards, and costs of oil and gas operations.

Response 11.5 - Historically the level of domestic oil & gas exploration has been responsive to the price of oil. While the imposition of additional measures to protect the environment could affect some individual oil and gas operators, it is not expected to have a significant

impact on the overall level of domestic oil & gas exploration and development. Also see response 10.1.

Comment 11.6 - B. This study is not remotely balanced. Why do you recognize that the air quality impact associated with oil and gas is minimal, yet propose specific prohibitions and constraints which greatly affect the cost of the operation? On the other hand you state that "Exploration and development activity on federal leases... is not expected to have a significant impact on local or regional economies. "What about property taxes? What about local employment of lease operators? Even if the contribution to the economy is small --it exists. It is not balanced to consider environmental impacts which are small or negligent, and not consider economic impacts because they are considered to be small. Its the many small business that make or (currently) break our economy. Increased regulation, especially for questionable benefits, can only negatively impact the maintenance and growth of small business.

Response 11.6 - The purpose of an Environmental Impact Statement (EIS) is to document the environmental impacts associated with a proposed action. Consequently, an EIS tends to focus on environmental impacts. Every effort has been made to review the potential environmental impacts in an objective manner. Also see responses 7.5, 7.16, and 10.1.

Comment 11.7 - A. The cost to the American taxpayer, and private property owners overlying federal minerals, has not been considered. There needs to be a quantitative analysis made of the consequences of your proposed T&E requirements. Does the cost justify the T&E actions? The salaries and expenses of those employed doing biological studies, monitoring and management have to be paid by somebody. If there is no or limited oil and gas activities there won't be many of these kinds of jobs created.

Response 11.7 - see responses 7.5 and 7.8.

Comment 11.8 - B. Most of the lands, west of I-5 where you have T&E stipulations, are cattle grazing lands. Do you intend to cancel all grazing rights on the federal lands? Obviously, the grazing activity contributes much more to PM10 air quality degradation and the disturbance of natural habitat than oil and gas activity. The degree of balance (i.e. benefits vrs costs) of a proposed land use restriction can be more clearly viewed when the restriction is applied fairly across the board to all users of the land. It is not apparent that this study has done this.

Response 11.8 - The purpose of this Environmental Impact Statement is to evaluate the environmental impacts of Oil & Gas leasing. Other studies are currently being developed to evaluate application of PM10 emission standards on other public land activities. We concur with your comment that restrictions should be applied uniformly and equitably to all public land users.

COMMENT LETTER #12
MARK R. HANSEN
BIG HORN OIL & GAS, INC.
18138 VARDEN DRIVE
MADERA, CA 93638

Comment 12.1 - Secondly, the selection of Alternative "D", while appearing to be a compromise with Environmental factions, national energy security and industry needs, does not represent an objective approach. It makes the assumption that 1) the oil and gas industry is to blame for the loss or decline of certain species, not taking into consideration the effects of the extended drought; 2) certain of the species under investigation are actually declining, threatened or extinct as a result of oil/gas exploration and development, when, in actuality, there was never a factual inventory or study completed prior to potential influence on the area(s) of concern which established a decline from one point to another (when, in fact, the current study concluded that some particular species actually thrive in the oilfield environment due in part, to their protection from other activities); 3) fluctuations of certain species populations are not due to natural factors; 4) said species are even present in the entire area proposed for restriction; and most brazen and self-serving of all that 5) the only place these species exist now, or have any possibility of survival are on lands owned or managed for the "Public Trust" by the Bureau of Land Management, when all actual habitats or populations are not known nor has there been a concerted effort to determine the full existence of such, nor would it be possible to determine such because of the prohibitive costs, which environmental groups feel should always be borne by "others".

Response 12.1 - The BLM has based the analysis on the best scientific information available on the distributions, habitat relationships, population biology, and legal and regulatory policies of the federal and California Endangered Species Acts. Through these legal and regulatory policies, the BLM has the responsibility to preserve and provide for the recovery of listed species. The BLM is proposing to manage the federal lands under its authority to best meet energy development needs while protecting endangered species habitat that will support viable populations of listed species in perpetuity. Also see responses 7.8, 8.2, and 10.8.

Comment 12.2 - I do not question your sincerity and I appreciate the situation of responsibility for managing and administering multiple use lands for the public trust. However, it must be pointed out the stipulation of Alternative "D" as the "Pinnacles Viewshed" is highly misleading and grossly exaggerated due to the fact that, with the exception of a few thousand acres, virtually all of the lands proposed for new, additional restriction and regulations are miles to the east of and not even visible from the Pinnacles National Monument. This designation cleverly misleads the public at large into believing that the Pinnacles National Monument is the primary beneficiary of this bit of policy changing. If this were really the case, Alternative "C" would certainly suffice.

Response 12.2 - see response 1.1.

Comment 12.3 - However if nothing else, I would ask that the area (I-5 corridor) of Alternative "D" be open to revision and reduction in size and scope based upon ongoing inventories and field surveys for T&E species. Additionally and more specifically, if areas requested for Oil and Gas exploration are discovered to have no T&E species, that area be removed from T&E boundaries and be relieved of restrictions of such, particularly if an area proves to be oil/gas productive.

Response 12.3 - We agree with your comment and are committed to continually refining the scientific data on habitat requirements and distribution of T&E species. Lease areas covered by the Special Endangered Species stipulation will be adjusted to reflect the best available scientific information. Also see response 10.8.

COMMENT LETTER #13
TEXACO E.C. BURRETT
P.O. BOX
DENVER, COLORADO

Comment 13.1 - A bias towards highly restrictive management in the Hollister Resource Area is evident from the limited range of alternatives developed in the DEIS. A range from no leasing to leasing with highly restrictive stipulations is not a balanced selection as required by the National Environmental Policy Act (NEPA). BLM should include at least one alternative that allows leasing with standard terms for the entire resource area.

Response 13.1 - see response 10.2.

Comment 13.2 - There is no justification in the DEIS for BLM's decision not to lease in certain areas, or to impose no surface occupance (NSO) stipulations. There was no discussion in the document as to why less restrictive measures would be inadequate to protect surface resources. These are some examples:

* The eagle winter habitat might not require NSO stipulations, but be better addressed through timing (seasonal) stipulations.

* There is no justification for non-waivable NSO stipulations for areas around Pinnacle National Monument. The DEIS classifies this area as Visual Resource Management (VRM) Class II and III. Reasonable mitigation measures, such as screening, might address visual concerns while providing a less restrictive approach.

Response 13.2 - see responses 10.3, 10.4, and 10.5.

Comment 13.3 - The use of "conditional" NSO stipulations is unjustified. Nor is this type of stipulation found in the "Uniform Format for Oil and Gas Lease Stipulations" developed

by the BLM to eliminate inconsistencies in use of lease stipulations and notices among the various BLM offices.

Response 13.3 - see response 6.1.

Comment 13.4 - Texaco disagrees with your conclusion that severe constraints are necessary in order to protect T&E species and their habitats. Section 6 of the standard lease form provides full protection for T&E species and designated habitat. Further, Section 7 of the Endangered Species Act (ESA) requires consultation prior to approval of any activity which could adversely affect T&E species or habitat. This "overlay" legislative protection alleviates the necessity for special stipulations.

BLM's proposal to impose NSO and other severe restrictions in areas that are "potential" T&E habitat is also unjustified. Critical habitat of protected species should have already been delineated in compliance with the 1982 amendment to ESA. This amendment requires the Federal Government to designate critical habitats within 12-18 months of listing. Delaying these designations results in delay of on-going oil and gas operations. Nor should our industry be expected to pay for these surveys which is the responsibility of the management agencies.

Response 13.4 - see responses 10.7 and 10.8.

Comment 13.5 - We oppose efforts to reintroduce listed species in developed fields. Our industry is already heavily burdened with restrictions. This will only serve to create additional conflicts. The best time for this action is when the field is depleted.

Response 13.5 - see response 10.14.

Comment 13.6 - While the BLM suggests oil and gas activity could have a negative impact on air quality in the Pinnacles National Monument area, no specific data is offered to support such a conclusion. This conclusion can only serve to inflame the public unnecessarily. Moreover, the mitigation measures proposed in chapter 4 to protect air quality appear unnecessary and redundant. Most local jurisdictions have established air pollution control districts which have implemented air quality permitting programs with which all emission sources must comply.

Response 13.6 - see responses 2.5 and 10.19.

Comment 13.7 - While your requirement to convert diesel engines in new or existing fields in the San Joaquin valley has some merit by reducing air pollution, the cost of such conversion is prohibitive and will discourage future oil and gas development. The oil and gas industry has lost thousands of jobs over the last ten years, partly due to these type of excessive environmental regulations. This is just one example. Mitigation options should be considered on a case by case basis rather than as blanket requirements.

Response 13.7 - see response 10.20.

COMMENT LETTER #14
STATE OF CALIFORNIA
OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET
SACRAMENTO, CA 95814

Comment 14.1 - The DEIS addresses potential impacts at a programmatic level. We would expect a more detailed environmental review of individual leases with specific mitigation for each project. Because of the large number of special status species involved and the large geographic area and many habitat types, the general mitigation measures described may not be adequate.

Response 14.1 - A site-specific environmental analysis would be completed before any surface disturbing activities are authorized. In the T&E habitat areas, additional habitat and species inventory and evaluation would be required before any surface occupancy would be authorized. Appendix E in the Final EIS is a draft of the special stipulation that would be applied to leases in T&E species habitat areas.

Comment 14.2 - It is stated in the DEIS that "specialized habitats... would be avoided by surface-disturbing activities when practical and feasible alternatives exist," and that "when losses occur...because they cannot be avoided then reclamation of those habitats would be required of the lessee." Mitigation measures need to include both reclamation of the disturbed site and acquisition or enhancement of in-kind acreage. Mitigation ratios would depend upon the amount and value of habitat loss.

Response 14.2 - The referenced management guidance has been changed in the Final EIS in response to your comment.

Comment 14.3 - Surface occupancy within one-half mile of known raptor nest sites during nesting and fledgling seasons would be prohibited under the DEIS. Surveys to locate active raptor nests should also be required prior to activities.

Response 14.3 - Inventories typically would be conducted when the site-specific environmental analysis is conducted. See response 14.1.

Comment 14.4 - The reclamation process described in the DEIS includes stockpiling topsoil to be distributed over the disturbed area upon termination of operations. It is stated that reclamation could include the purchase of native plant seeds or seedlings for revegetation. Stockpiled topsoil can be expected to be an effective medium and source of plant materials for re-establishing vegetative areas for only a limited time, generally not more than two to

three years. Revegetation of reclaimed sites should include on-site collection of native plant seed, rather than purchase from an off-site source.

Response 14.4 - The comment has been incorporated into the Final EIS.

Comment 14.5 - According to the DEIS "destruction of potential threatened and endangered (T&E) plant habitat would require acquisition and transfer to the BLM of comparable off-site habitat." Additional mitigation measures need to be implemented where special status plant species are impacted. These may include acquisition of acreage at a 3:1 ratio, as well as propagation and revegetation of plant species. However, because success of revegetation projects with some species may be tentative, avoidance of impacts is recommended.

Response 14.5 - We agree that avoidance of impacts is the preferred alternative whenever possible. See response 8.4 per discussion of mitigation ratios.

Comment 14.6 - Special status plants addressed in the DEIS should include Abbott's bush mallow (Malacothamnus abbottii), a Federal Candidate Category 1 species that occurs in the San Ardo area.

Response 14.6 - This species was misnamed in Appendix D in the Draft EIS as Malacothrix abbottii. This bushmallow was listed in Appendix D (Special Status Plant Species with Low Potential to be Affected by Oil and Gas Activities) because there is only a low potential that it occurs on the 40 acres of public lands projected as likely to be further developed for oil and gas resources during the 15 year lifespan of the EIS.

Comment 14.7 - The DEIS states that off-site mitigation would be required if development activities in newly-developed fields resulted in loss of habitat for the Santa Lucia deer herd. The Santa Lucia herd is located in western Monterey County. Impacts to other deer herds should be addressed and mitigation measures specified.

Response 14.7 - The other two deer herds referred to are the Avenal herd and the San Benito herd. The Santa Lucia deer herd occurs in an area expected to have high potential for oil & gas development, while the other two herds are in areas with moderate or no potential for development. Because only temporary impacts were anticipated to occur with no permanent habitat loss within the habitat of these other herds, no specific mitigation was proposed.

Comment 14.8 - Guidelines are given in Appendix C for avoidance of and mitigation for impacts to threatened and endangered animal habitat in the Panoche/Coalinga area. These guidelines should be implemented in T&E plant and animal habitats throughout the Hollister Resource Area, as applicable. Impacts to T&E species will require consultation under Section 2081 of the California Endangered Species Act, as well as under Section 7 of the Federal Endangered Species Act.

Response 14.8 - Application of the Panoche/Coalinga ACEC guidelines to all comparable T&E habitats in the resource area was included in the Draft EIS as management guidance that applied to all alternatives (page 15). California BLM policy to confer with the California Department of Fish & Game Regional Manager whenever adverse impacts are forecast for a state listed species has been referenced in the T&E mitigation discussion in the Final EIS.

Comment 14.9 - Mitigation ratios for loss of T&E species' habitat are not specified in the DEIS. We recommend mitigation ratios of 3:1 for long-term impacts and 1:1 for short-term impacts. Mitigation for habitat loss for the San Joaquin antelope squirrel should also be required, as well as for the San Joaquin kit fox, blunt-nosed leopard lizard, and giant kangaroo rat.

Response 14.9 - see response 8.4.

Comment 14.10 - Impacts to California Species of Special Concern have not been adequately addressed in the DEIS. These include, but are not limited to; the burrowing owl (Athene cunicularia), American badger (Taxidea taxus), California tiger salamander (Ambystoma tigrinum californiense), California red-legged frog (Rana boylii), southwestern pond turtle (Clemmys marmorata pallida), San Joaquin whipsnake (Masticophis flagellum ruddocki), long-eared owl (Asio otus), San Joaquin pocket mouse (Perognathus inornatus inornantus), Townsend's western big-eared bat (Plecotus towndsendii towndsendii), and California mastiff bat (Eumops perotis californicus). The California Natural Diversity Data Base should be consulted for a more complete list of special status species that have been recorded in the project area.

Response 14.10 - Impacts to species of special concern would be avoided or mitigated on a case by case basis when site specific Environmental Assessments (EAs) are completed. Site specific EAs would be required before Applications for Permit to Drill (APD) or other surface disturbing lease activities are allowed. The BLM will include California species of concern as criteria to be evaluated in these EAs with impacts avoided wherever possible. The BLM subscribes to the California Natural Diversity Database and uses this resource to supplement BLM habitat and species inventory data.

Comment 14.11 - Impacts addressed in the DEIS are predominately those directly associated with exploration and well development with little attention given to impacts from access road construction and increased vehicular activity. Mitigation measures proposed to reduce impacts to visual resources include placement of roads, well pads, and other facilities out of the viewshed of existing public roads. This may result in the fragmentation and further loss of wildlife habitat. Particularly in sensitive habitat areas, the placement of new roads and buildings close to existing ones may reduce impacts to plant and wildlife species.

Response 14.11 - In T&E habitat areas, the primary mitigation strategy will be to avoid and/or minimize impacts to T&E species or habitat. We do not believe the visual resource mitigation measures proposed in the EIS (avoid road construction on slopes visible from

major roads whenever practical) would necessarily increase habitat fragmentation. Potential fragmentation of habitat, however, would be evaluated in the site-specific environmental analysis that would precede any specific development authorization.

Comment 14.12 - According to the DEIS, consultation with the Fish and Wildlife Service would be triggered if 400 or more acres of special status plant or animal species habitat were impacted. Consultation with both the Fish and Wildlife Service and this Department should be required if any special status species' habitat is impacted.

Response 14.12 - see responses 8.3 and 8.8.

COMMENT LETTER #15
CHEVRON U.S.A. PRODUCTION COMPANY
P.O. BOX 1392
BAKERSFIELD, CA 93302

Comment 15.1 - Page 11, paragraph 4; page 76 and 84, "Mitigation": Permanent disturbance to known threatened and endangered species habitat should not be precluded. Rather it should be allowed of the applicant is willing to provide offsite compensation for the disturbance.

The BLM's consideration of land compensation as an acceptable alternative would allow projects to proceed without extensive permitting delays. The upfront compensation could be offered in lieu of a Section 7 permit process that involves delays because of the supposed lack of botanical or wildlife information. The ability of BLM to enforce this alternative would eliminate the permitting inconsistencies and delays directly attributed to U.S. Fish and Wildlife Service's (USFWS) review.

Compensation lands can then target species preservation in key areas, rather than trying to preserve the species in a "patchwork" approach within heavily developed oilfields.

Response 15.1 - BLM policy is to avoid impacts to T&E species and viable habitat whenever possible. Only when impacts cannot be avoided is mitigation considered a viable alternative. The BLM endorses the upfront compensation proposed by Chevron to mitigate and offset oil field exploration and development, particularly in those situations where maintenance of viable habitat may not be compatible with intensive development. We look forward to meeting with Chevron and other industry representatives to establish mitigation bank areas for development of long-term habitat conservation programs that would help recovery of the species and mitigate for ongoing impacts.

Comment 15.2 - Page 15, paragraph 1, line 9: The word "impacts" should be preceded by the word "permanent". The BLM must acknowledge in this RMP that some disturbance is

temporary (e.g. seismic), and some is permanent. Temporary disturbance should be exempt from the majority of mitigation measures.

Response 15.2 - see response 10.12.

Comment 15.3 - Pages 16 and 17, "Measures to Protect Air Quality"; page 69, "Mitigation": BLM's jurisdiction over air quality permitting should not supersede local air pollution control district regulatory requirements.

Response 15.3 - see response 10.19.

Comment 15.4 - Page 23, "Alternative D", item C; page 76, "Mitigation": The term "potential habitat" gives BLM the opportunity to delay a decision for lack of current data. For example, during the San Joaquin Valley's drought periods (which follow regular cycles) the BLM claims there is insufficient data with respect to threatened and endangered species of plants. The BLM and USFWS then prolong a decision on a permit, sometimes in excess of 4 years! Sensitive habitat associated with a given project area should be evaluated based on current available data.

Response 15.4 - see responses 10.10 and 10.8.

Comment 15.5 - Page 23, "Alternative D", additional mitigation item B: This sentence should be revised to read: "Permanent destruction of known T&E plant habitat may be offset through the acquisition and transfer to the BLM of comparable off-site habitat (compensation land). This alternative would enable a project to proceed without extensive permitting delays".

Response 15.5 - see response 10.9.

Comment 15.6 - Page 23, "Alternative D", additional mitigation item D: This sentence should be revised to read: "Development of new O&G fields in known T&E animal habitat would be limited to one pad per 40 acres, unless denser development is offset by the acquisition of compensation land".

Response 15.6 - see response 10.11.

Comment 15.7 - Page 92, "Mitigation Measures, Existing Oil Fields, line 3": This line should be amended to read "...all contamination by hazardous materials is cleaned up by using a risk management approach in conjunction with applicable state and federal laws, and denuded areas...".

Response 15.7 - The statement has been amended in the Final EIS to add "per State and Federal laws."

Comment 15.8 - Page 124, "Geophysical Exploration": Paragraph 2, line 5: Replace "one-hale" with one-half. Paragraph 5, lines 1 and 2: Revise the lines to read "The surface charge method usually utilizes either a two and one-half or a five pound charge attached to a wooden lath about three feet above the ground surface. The charge can result in the...". Paragraph 7, line 2: Revise this line to read "...200 feet deep. Commonly a 40-70 pound charge of explosives...".

Response 15.8 - The suggested corrections have been made in the Final EIS.

COMMENT LETTER #16
LES CLARK, JR.
INDEPENDENT OIL PRODUCERS' AGENCY
915 N. 10TH ST., SUITE 20
TAFT, CA 93268

Comment 16.1 - Pg. 2 One pad per 40 acres is unacceptable.

Response 16.1 - see response 10.11.

Comment 16.2 - Pg. 2 Air quality modeling is expensive - Is BLM paying for the modeling runs?

Response 16.2 - see comment 2.5 and response 7.1.

Comment 16.3 - Pg. 2 How do you know air quality impacts exist? Is there monitoring data or does BLM have existing modeling information?

Response 16.3 - see comment 10.18.

Comment 16.4 - Pg. 2 Restricting new operations in these fields will defer activity indefinitely.

Response 16.4 - Since 1991 the BLM has completed baseline rare plant inventories for most potential habitat in these fields. Because these inventories have located populations and refined our knowledge of habitat requirements, lengthy delays in approval of lease operations may not be necessary to assure protection of the species. Also see response 10.8.

Comment 16.5 - Pg. 2-3, Off-site mitigation lands and compensation will eliminate several independents from operating BLM properties.

Response 16.5 - see responses 7.5 and 7.8.

Comment 16.6 - Pg. 3 What is a redundant oil well facility?

Response 16.6 - see response 7.2.

Comment 16.7 - Pg. 3 Are you talking federal standards or state standards?

Response 16.7 - The reference is to federal standards which are being exceeded for ozone, carbon monoxide, and PM-10.

Comment 16.8 - Pg. 3 Fresno County is no longer considered an individual county - Fresno is a part of the San Joaquin Unified Air Pollution Control District (SJVUAPCD).

Response 16.8 - This change has been made in the Final EIS.

Comment 16.9 - Pg. 3 Is BLM defining and requiring BACT?

Response 16.9 - see responses 10.19 and 11.4.

Comment 16.10 - Pg. 3 BACT is still a topic of discussion in the SJVUAPCD and each rule will be workshopped prior to final adoption by the SJVUAPCD. Electric motors on diesel-powered drilling rigs will be very expensive and have not been declared BACT in the District as far as I know.

Response 16.10 - see response 7.13 and 11.4.

Comment 16.11 - Pg. 5 Retroactive regulations on existing leases need to be better defined.

Response 16.11 - see response 7.3.

Comment 16.12 - Pg. 8 Why or how could an independent oil producer justify bidding on a property with a no surface occupancy stipulation?...again, excluding the independents.

Response 16.12 - see responses 6.2, 6.3, and 7.4.

Comment 16.13 - Pg. 9 The restrictions (compensation/mitigation) associated with geophysical explorations complicate and some cases stop surveys.

Response 16.13 - see responses 7.5 and 7.8.

Comment 16.14 - Pg. 10 Is BLM planning to evaluate air control technology?

Response 16.14 - see responses 7.2 and 10.19.

Comment 16.15 - Pg. 10 What is upwind? Transport, modeling and monitoring issues should be left to the SJVUAPCD.

Response 16.15 - Upwind refers to potential lease areas from which prevailing wind patterns could carry pollutants over Class I areas. The National Environmental Quality Act requires the BLM to consider all the environmental impacts of any federal action, including those impacts that may be outside the regulatory jurisdiction of the BLM to control. Also see response 10.19.

Comment 16.16 - Pg. 12 Visual quality is also a complex issue and needs to be better discussed in the draft report.

Response 16.16 - The BLM believes the discussion of visual resource issues is adequate. Additional background information on visual resource inventory, evaluation, and management is available for your review at the Hollister Resource Area, 20 Hamilton Court, Hollister, CA. This background information includes BLM manuals, U. S. Forest Service technical publications, conference proceedings, and guidance from the American Society of Landscape Architects. Also see responses 1.1 and 7.9.

Comment 16.17 - Pg. 13 What is BLM's definition of potable ground water?

Response 16.17 - The term "potable ground water" was not used on page 13 of the Draft EIS. Concerns about contamination of groundwater resources is not limited to "potable" water but must also consider other beneficial uses. Also see comments 4.4 and 4.5.

Comment 16.18 - Pg. 13 Duplication... Division of Oil and Gas, Regional Water Quality Control Board, and the federal EPA Spill Control and Countermeasure Plans specify procedures sufficient to preclude contamination of groundwater resources.

Response 16.18 - The analysis on page 88-89 of the Draft EIS concurred with your suggestion. Also see response 16.15.

Comment 16.19 - Pg. 13 Additional restrictions placed on oil and gas exploration will definitely have a negative impact on domestic oil production. Less BLM oil properties - more reliance on foreign oil. Government revenues will decrease. California has a high unemployment rate and there is no doubt that local employment opportunities in already depressed oilfield towns such as Coalinga will get worse.

Response 16.19 - see responses 10.1 and 11.5.

Comment 16.20 - Pg. 16 Surface Disturbance - Are you referring to PM 10 control? There is not an existing regulation.

Response 16.20 - Regulations are currently being developed by the San Joaquin Valley Regional Air Quality Control Board (Rule # 8010) with implementation expected in 1993. The purpose of this stipulation is to assure that all lease actions on federal lands are in full compliance with the appropriate regulations when they are adopted.

Comment 16.21 - Pg. 17 BACT - Is BLM planning to determine BACT?

Response 16.21 - see response 11.4.

Comment 16.22 - Pg. 17 Analysis - What type of analysis for the potential use of gas or electric motors in lieu of diesel-powered drilling rigs?

Response 16.22 - see responses 7.13 and 10.20.

Comment 16.23 - Pg. 17 Fugitive dust regulation? Existing roads, new roads, paved and unpaved roads. What type of pavement? Offsets?

Response 16.23 - see response 16.20.

Comment 16.24 - Pg. 23 What type of air model and who will pay for modeling runs ?

Response 16.24 - see comment 2.5 and responses 7.1 and 10.18.

Comment 16.25 - Pg. 23 Definition of comparable off-site habitat? Mitigation ratio.

Response 16.25 - see response 8.4.

Comment 16.26 - Pg. 24 Increase in emissions...how does this happen when the new source review rule has a no net increase stipulation? This time you have referred to the San Joaquin Valley Air Quality Basin instead of Fresno County - Which is it?

Response 16.26 - Fresno County is included in the San Joaquin Valley Air Quality Basin. Also see response 6.5.

Comment 16.27 - Pg. 31 Total emissions from BLM less than 1% (negligible). Why isn't this discussion in the summary?

Response 16.27 - The summary discussion focuses on residual and potentially significant impacts. While the total emissions from BLM O&G leases may appear negligible, the cumulative impact of this action and numerous other "negligible" emission sources results in a significant environmental health hazard. Also see response 7.16.

Comment 16.28 - Pg. 32 Need to discuss in more detail your numbers and impacts on vegetation.

Response 16.28 - see response 10.22.

Comment 16.29 - Pg. 33 Does BLM list differ from Fish & Wildlife and Fish and Game (special status designation)?

Response 16.29 - see comment and response 8.9.

Comment 16.30 - Pg. 43 What is the status of "candidate" species?

Response 16.30 - Candidate species (C1, C2, & C3) are species designated by the U. S. Fish & Wildlife Service as candidates for listing as threatened or endangered.

Comment 16.31 - Pg. 44 Need to discuss the VRM Class - sociological characteristics? Designated through RMP process?

Response 16.31 - Visual resource management objectives were determined for public lands in the Hollister Resource Area in the Hollister Resource Management Plan (RMP) which was adopted in 1984. Also see response 16.16.

Comment 16.32 - Pg. 67 Discussion of emission increases - emission factors?

Response 16.32 - The intent of your comment is unclear. Please refer to the cited Dennison study for additional information on development of the emission numbers (Emission Characteristics of Crude Oil Production Operations in California, Final Report. KVB, Inc. Sacramento, CA 1983). This report is available from the University of California library system.

Comment 16.33 - Pg. 68 No drop in emissions of NOx or particulate matter - Are you referring to only stationary sources?

Response 16.33 - This general trend data reflects both stationary and mobile sources (CARB 1988).

Comment 16.34 - Pg. 68 Discussion with staff should take place...Pgs. 67, 68 & 69. Don't understand numbers.

Response 16.34 - see comment 16.32.

Comment 16.35 - Pg. 69 Simultaneous reduction - depends on which scientist is consulted.

Response 16.35 - This information is from the California Air Resources Board publication "San Joaquin Valley Growth and Air Quality Impacts - Technical Support Document" (1988).

Comment 16.36 - Pg. 69 "Emission from federal leases inconsequential...very substantial environmental degradation and health problem..." This statement is subjective...continued crop damage is also an inappropriate editorialized statement.

Response 16.36 - see response 16.35.

Comment 16.37 - Pg. 69 What diesel engines and facilities currently dominate the San Joaquin Valley oil fields?

Response 16.37 - see response 7.17.

Comment 16.38 - Pg. 70 The covering of oil production sumps is not an option for small producers - cost prohibitive.

Response 16.38 - see responses 7.5 and 7.18.

TABLE #11
LIST OF PREPARERS

NAME	RESPONSIBILITY	EDUCATION & EXPERIENCE
Steve Addington	Team Leader, Air Quality	BA, Anthropology BLM: 13 years
John Hervey	Visual Resources	MA, Fisheries Management BLM: 14 years
Dennis Johnson	Wildlife, T&E Animals	BS, Forestry (Wildlife) BLM: 32 years
Bruce Delgado	Vegetation, T&E Plants	BS, Wildlife Management BLM: 5 years
Mark Milliken	RFD Scenarios	MS, Geology USDI: 10 years
Ken Holden	Geophysical Exploration	MA, Geology USDI: 28 years
Larry Saslaw	T&E Animals (Review)	BS, Wildlife Management BLM: 16 years
Jack Mills	SO Review	MA, Planning BLM: 15 years
Phil Lopez	Soil, Water, and Air Quality Review	BA, Soils SCS: 5 years FS: 3 years BLM: 4 years
Bob Beehler	Management Direction	BA, Physical Geography BLM: 15 years
Pat Bell	DO Review	MA, Geology industry: 7 years BLM: 1 year
Robert Barney	SO Review	MS, Resource Geography BLM: 29 years
Ed Lynch	Planning & Environmental Coordination (P&EC)	MA, Botany BLM, 22 years

APPENDIX A

PLANNING CRITERIA

The planning criteria are the laws, regulations, policy and management guidance that govern the consideration of each issue. The planning criteria are developed during the scoping process and are made available for public review. A Notice of Availability (NOA) of the planning criteria was published in the *Federal Register* on June 6, 1991. Listed below are the planning criteria for each issue addressed in the Environmental Impact Statement.

ISSUE #1 - AIR QUALITY

Clear Air Act as amended - Federal law providing national policy on air pollution prevention and control.

Executive Order 11752 (Air & Water Quality) - This Presidential order mandates that federal agencies shall provide national leadership to protect and enhance the quality of air, water, and land resources through compliance with applicable federal, state, and local pollution standards.

BLM Manual 1621.1 (Supplemental Program Guidance for Environmental Resources: Air Resources) - Provides BLM guidance and quality standards for air resources during the development of land use plans (Resource Management Plans).

Federal Land Policy & Management Act of 1976 - This Act provides for management of the public lands under principles of multiple use and sustained yield. The Act specifically calls for the periodic and systematic inventory of public land resources; the development, maintenance, and revision of land use plans using an interdisciplinary approach; and compliance with state and federal air and water pollution standards.

ISSUE #2 - THREATENED, ENDANGERED AND OTHER SPECIAL STATUS PLANTS

Endangered Species Act of 1973 (as amended) - Federal law requiring the BLM to insure that its actions are not likely to jeopardize the continued existence of listed threatened or endangered species. Section 7 of the Act also requires BLM to consult with the U.S. Fish and Wildlife Service whenever actions are proposed that may affect listed threatened or

endangered species. The Act also orders BLM to carry out programs for the conservation of listed endangered or threatened species.

BLM Manual 6840 (Special Species Management) - Provides BLM policy and guidance for the conservation of special status species of plants and animals, and the habitats on which they depend. Special status species include officially listed species (threatened or endangered species), species that are proposed or candidate species for listing, state listed species, and species listed as "sensitive" by the BLM State Director.

California BLM Manual Supplement 6840.2 (State Listed Plants and Animals) - Provides BLM policy and guidance for the conservation of plants and animals, and the habitats on which they depend, which are officially listed as rare or endangered pursuant to California State Law.

BLM Standard Lease Terms & Conditions (BLM Form 3100-11) - Conditions and terms included on the standard lease form which are applied to all BLM oil & gas leases. Included in Section 6 are provisions requiring the operator to minimize impacts to biological resources, take reasonable measures required by the BLM to protect resources, conduct minor inventories or short term special studies, contact the BLM if threatened or endangered species are observed, and cease operations that would result in the destruction of threatened or endangered species.

43 Code of Federal Regulations 3101.1-2 - Federal regulations providing lessee with right to explore and develop leased lands subject to lease stipulations, restrictions from nondiscretionary statutes, and reasonable measures required by the authorized officer. Provides that reasonable measures, at a minimum, are consistent with lease rights if they do not require relocation of operations more than 200 meters, require siting of facilities off the lease, or prohibit surface disturbing operations more than 60 days in any lease year.

Area Manager Decision/Policy: Prior to authorization of any surface disturbing activity, a review of existing ecological data will be conducted to determine if any species of concern may exist on the proposed site. If this review indicates species of concern may occur on the site, then a site-specific field examination will be conducted during the appropriate season to determine if the species occupies the site. If species occur, then all surface disturbing activity will be moved up to 200 meters to avoid adverse impacts to the species. If movement of the site this distance is insufficient to avoid impacts, then additional mitigation measures will be developed in conjunction with Section 7 consultation with the U. S. Fish & Wildlife Service.

ISSUE #3 - THREATENED, ENDANGERED AND OTHER SPECIAL STATUS ANIMALS

Endangered Species Act of 1973 (as amended) - Federal law requiring the BLM to insure that its actions are not likely to jeopardize the continued existence of listed threatened or

endangered species. Section 7 of the Act also requires BLM to consult with the U.S. Fish and Wildlife Service whenever actions are proposed that may affect listed threatened or endangered species. The Act also orders BLM to carry out programs for the conservation of listed endangered or threatened species.

BLM Manual 6840 (Special Species Management) - Provides BLM policy and guidance for the conservation of special status species of plants and animals, and the habitats on which they depend. Special status species include officially listed species (threatened or endangered species), species that are proposed or candidate species for listing, state listed species, and species listed as "sensitive" by the BLM State Director.

California BLM Manual Supplement 6840.2 (State Listed Plants and Animals) - Provides BLM policy and guidance for the conservation of plants and animals, and the habitats on which they depend, which are officially listed as rare or endangered pursuant to California State Law.

BLM Standard Lease Terms & Conditions (BLM Form 3100-11) - Conditions and terms included on the standard lease form which are applied to all BLM oil & gas leases. Included in Section 6 are provisions requiring the operator to minimize impacts to biological resources, take reasonable measures required by the BLM to protect resources, conduct minor inventories or short term special studies, contact the BLM if threatened or endangered species are observed, and cease operations that would result in the destruction of threatened or endangered species.

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50 Code of Federal Regulations; Part 402 - Federal regulations implementing Section 7 of the Endangered Species Act. These provide specific procedural guidance for federal agencies to assure compliance with Section 7 of the Act.

Area Manager Decision/Policy: Measures included in the Panoche/Coalinga ACEC Plan to mitigate oil & gas exploration and development activities will be implemented in all areas within the resource area where potential or occupied habitat for these species occurs.

ISSUE #4 - VISUAL QUALITY

BLM Manual 8400 (Visual Resource Management) - Provides BLM policy and guidance for management of the public lands in a manner which will protect the quality of the scenic (visual) values of these lands.

Federal Land Policy and Management Act of 1976 -This Act provides for management of the public lands under principles of multiple use and sustained yield. The Act specifically requires that public lands be managed in a manner that will protect the quality of scenic values.

National Environmental Policy Act of 1969 - This Act provides national policy for environmental protection. The Act states that it is the national environmental policy to use all practicable means to assure all Americans aesthetically pleasing surroundings.
BLM Standard Lease Terms & Conditions (BLM Form 3100-11) - Conditions and terms included on the standard lease form which are applied to all BLM oil & gas leases. Included in Section 6 are provisions requiring the operator to take reasonable measures to minimize impacts to visual resources.

43 Code of Federal Regulations 3101.1-2 - Federal regulations providing lessee with right to explore and develop leased lands subject to lease stipulations, restrictions from nondiscretionary statutes, and reasonable measures required by the authorized officer. Provides that reasonable measures include, but are not limited to, modification to design or siting of facilities, and relocation of proposed operations by up to 200 meters.

ISSUE #5 - GROUNDWATER OR SURFACE WATER QUALITY

43 Code of Federal Register 3160 (Onshore Oil and Gas Order No. 1) - Federal regulations establishing procedures for approvals of wells on federal oil and gas leases. Requires operator to assure that underground sources of fresh water will not be endangered by any fluid injection operation.

BLM Manual 3160-1 (Application for Permit to Drill & Subsequent Operations) - BLM regulations providing guidelines and procedures for processing Applications for Permit to Drill. Requires that downhole drilling plan is adequate to protect all fresh water sources.

Surface Operating Standards for Oil & Gas Exploration and Development - Interagency guidelines developed to provide design and construction techniques and other practices that would minimize surface disturbance, effects on other resources, and maintain reclamation potential of lease sites.

Regional Water Quality Control Board Basin Plans -Regional plans that establish water quality control objectives for specified water basins. The two plans that provide guidance for the Hollister Resource Area are the Central Valley Basin and Central Coast Basin Water Quality Plans.

ISSUE #6 - MINERAL EXPLORATION AND DEVELOPMENT

The Mineral Leasing Act of 1920 - Provides that oil & gas deposits on public lands are available for leasing. This act authorizes the Secretary of the Interior to issue leases to individuals and organizations providing for the exclusive right to explore for and develop mineral resources within the lands covered by the lease.

The National Materials and Mineral Policy Research and Development Act of 1980 - States the current policy of the Federal government regarding oil and gas exploration and development. This Act states that private enterprise is to be encouraged to develop domestic mineral resources and that Federal agencies are to facilitate availability and development of domestic resources. It also emphasizes prompt reclamation of disturbed lands.

The Federal Land Policy and Management Act of 1976 - FLPMA authorizes the Secretary of the Interior to withdraw public lands from entry under the mineral leasing laws. However, on withdrawals of 5,000 acres or more in size, the Secretary must notify both Houses of Congress of the withdrawal. Congress then has 90 days to nullify that action.

43 Code of Federal Regulations 3100 - Federal regulations establishing procedures for issuance of oil & gas leases on public lands.

43 Code of Federal Regulations 3160 - Federal regulations providing procedures for approval of oil & gas exploration and development on public lands.

APPENDIX B

OIL AND GAS OPERATIONS ON PUBLIC LANDS

This appendix presents a more detailed description of typical oil and gas operations on public lands.

Geophysical Exploration

Oil and gas can be discovered by either direct or indirect exploration methods. Direct exploration methods include the mapping of rock outcrops and oil seeps by geologists, often on foot; or more disruptive drilling and subsequent drill core analysis. Indirect methods include seismic and gravity surveys which can be used to delineate features which may contain oil and gas.. The general term for the indirect methods is geophysical exploration, of the two methods a gravity survey will usually cause less disturbance.

Gravitational prospecting detects micro-variations in gravitational attractions caused by the differences in the density of various types of rock through the use of an instrument known as a gravimeter. Data derived from gravity surveys is used to generate anomaly maps, from which faults and general structural trends can be interpreted. Survey measurements are taken at many points along a linear path with a gravimeter. The gravimeter is transported either by backpack, helicopter, or off-road vehicle (ORV). Because gravity surveys can be conducted from the air or by a backpacker, surface disturbance is not necessary. However, surface disturbance may occur if ORV use is permitted for the purpose of conducting the survey.

A seismic survey is the most popular method currently utilized for locating subsurface structures which may contain oil and gases. Seismic prospecting is based on the fact that energy in the form of shock waves generated from a point source [or array of point sources] are reflected and/or refracted [bent] to varying degrees and then travel at different speeds as they pass through different rock types. An analogy is the dropping of a stone in a quite pool of water, where energy is seen as outward circles of waves emitting from the point source where the stone was dropped.

A seismic wave travels down into the earth, as the wave encounters rock layers of different compositions, some of the waves change velocity and slow or speed-up, some of the energy is reflected back up to the ground where sensing devices [called geophones] receive and allow recording of the energy variation.

Geophones are connected by ground wire to the recording truck where incoming data is stored on magnetic tape. The magnetic tape can be played back and processes through computers to give a presentation of the rock layers beneath the seismic array. The presentation can be printed onto a paper copy which has time/depth on the vertical axis and horizontal distance on the horizontal axis. The rock layers show up as dark and light bands of wave traces.

The time required for the original waves from the energy source to travel from the surface to a given rock layer [or reflector] and then to be received back at the surface, is known as two-way time. To find the one-way time down to the rock layer, and then convert this to depth down to the rock layer, you must multiply the wave velocity received from the geophone,by one-half the travel time recorded by the geophone. Time can then be converted to depth from surface down to the rock layer [or reflector] based on a table of average velocities through various types of rock layers.

The amount of disturbance is dependent on the type of energy source which is used. Energy sources can range from small explosive devices [either surface or shallow subsurface] to vibrations through the earth's crust created by Vibroseis trucks, sometimes called thumper trucks. These trucks vertically pound or vibrate [a more side to side motion] to create a shock wave. Usually an array of four large trucks are used. Each truck has a large [about four square feet] pad located under the truck between the front and rear wheels. The pad is lowered to make contact with the ground and then the truck is raised up off the ground so the energy is from a point source. Once information is sent down, reflected, received, and then recorded, the truck array is moved forward a short distance and the process is repeated. Usually about 50 square feet of surface area is required to operate the equipment at each recording site. Access is by public roads and existing private roads and trails where possible. Graders and 'dozers' may be required to provide access in remote areas, off-road cross-country travel may be needed in some cases.

The two explosive methods require that explosive charges be detonated on the surface or in a shallow [100 to 200 feet] drill hole. Access is as above. Several trips a day are made along a seismic line, this allows for extra information needed in recording and processing data.

The surface charge method usually uses, either a two and one-half or a five pound charge attached to a wooden lath about three feet above the ground surface. The charge can result in the destruction of vegetation and the disturbance of wildlife. The damage to vegetation is often undetectable after several growing seasons. Because of limited shock wave penetration this method is used where the target rocks are near the surface.

A typical drilling seismic survey may utilize a ten to fifteen member crew operating five to seven trucks. The vehicles used for a drilling program may include heavy truck-mounted drill rigs, track-mounted drill rigs, water trucks, a computer recording truck, and several

pick-up trucks for various crew members. In rugged topography, a portable drill may be carried in by helicopter.

Usually four to twelve holes are drilled per mile. The holes are small diameter and 100 to 200 feet deep. A 40 to 70 pound charge of explosives is placed in the hole, covered, and detonated. Under normal conditions three to five miles of line can be 'shot' or completed in a day. Drilling water may be trucked in or obtained from private land owners.

Geophysical Operations

Geophysical Operations may be conducted regardless of whether the land is leased or not. An operator is required to file a "Notice of Intent to Conduct Oil and Gas Exploration Operations" for all geophysical activities on public lands administered by the BLM. The Notice of Intent, should include maps showing the line location and access route, any anticipated surface damage, and a time frame for operations. The operator must be bonded.

Notices to conduct geophysical operations on BLM surface are received by the appropriate resource area. Administration and surface protection are accomplished through close cooperation of the operator and the BLM. Seasonal restrictions may be imposed to reduce fire hazards, conflicts with wildlife [including threatened and endangered species], watershed damage, recreational use, and other issues.

Notice of Staking

Notices of staking can only be approved , subject to regulations, on leases lands.
The federal lessee or operating company selects a drill site based on subsurface geology, geophysics, topography, and economic considerations. Once the company makes the decision to drill, they must decide whether to submit a Notice of Staking (NOS) or apply directly for a permit to drill. The NOS is an outline of what the company intends to do, including a location amp and sketched site plan. The NOS is used to review any conflicts with known critical resource values. The BLM utilizes information contained in the NOS and obtained from the onsite inspection to develop stipulations to be incorporated into the APD. As a result of the Federal Onshore Oil and Gas Leasing Reform Act of 1987 (Reform Act of 1987), upon receipt of an NOS the operator/company name, well name/number, well location and a map showing the drill site must be posted in a public place in the Bureau approving office and the Bureau Resource Area Office or the local surface management agency office for a minimum of 30 days prior to approving the APD.

Application for Permit to Drill (APD)

The operator may or may not choose to submit an NOS; in either case, an Application for Permit to Drill must be submitted. An APD consists of two main parts: the 13 point surface plan which describes any surface disturbance and is reviewed by resource specialist, and the eight point plan which details the drilling program and is reviewed by the petroleum engineer and geologist. For the APD option the onsite inspection is used to assess possible impacts and develop stipulations to minimize these impacts. If the NOS option is not utilized then the 30 day posting period as required by the Reform Act of 1987, will commence upon receipt of the APD by the BLM.

The BLM must prepare any site specific environmental documentation required by NEPA and develop mitigation measures necessary to protect any adversely affected resources. The BLM approves all wells drilled on federal minerals regardless of surface ownership. For privately owned surfaces it is the responsibility of the operator to obtain a surface owner agreement.

Drilling Phase

Once the APD is approved, the operator may begin construction activities. When a sit is chosen that necessitates the construction of an access road the length will vary, but usually the shortest feasible route is selected to reduce the haul distance and construction costs. Environmental factors or a landowner's wishes may dictate a longer route in some cases.

During the first phase the operator moves construction equipment over existing roads to the point where the access road begins. Depending upon the type of terrain, equipment may include dozers (track-mounted and rubber tired), scrapers, and graders. Existing roads and trails often require improvement in places and occasionally culverts and cattle guards are installed.

The second phase is the construction of the drilling pad or platform. In some cases no disturbance other than a mud (reserve) pit and cellar is required. If surface disturbance is necessary, soil material suitable for plant growth is removed and stockpiled in a designated area, to be used later for rehabilitation and reseeding. Drilling sites on ridgetops or hillsides are constructed by cutting and filling portions of the location after the topsoil has been removed. The majority of the excess cut material is stockpiled in an area that will allow it to be easily recovered for rehabilitation. It is important to confine extra cut material to a stockpile so that it can be recovered for rehabilitation of the drill site.

The amount of level surface required for safely assembling and operating a drilling rig varies with the type of rig, but is usually 200 feet by 250 feet for typical wells of 1,500 to 2,200 feet depths. Deeper wells will require larger pads because of the rig size and associated equipment. When construction of a drilling location requires cut and fill, the foundation of

the drilling derrick is usually placed on a cut surface ensuring that it rests on solid ground, thereby preventing it from leaning or toppling due to settling of uncompacted soil.

In addition to the drilling platform, a reserve pit is constructed. The reserve pit is used to contain the drilling fluids and drill hole cuttings. It is usually square or oblong, but is sometimes constructed other shapes to accommodate topography. Generally, the reserve pit is six to twelve feet deep, but may be deeper to compensate for smaller length and width for deeper drilling depths. In some instances mud tanks are utilized thus eliminating the need for a pit. For air drilling, smaller reserve pits are used; usually less than ten by ten feet and approximately six to ten feet in depth.

Depending on how the drill site is located relative to a natural drainage, it may be necessary to construct water bars or diversions to control surface runoff and erosion. The area disturbed for construction and the potential for successful revegetation depends largely on topography, soil type, climate, and the degree of disturbance.

Usually drilling activities begin shortly after the location and access road have been constructed. The drilling rig and associated equipment are moved to the location and erected.

Water for drilling is hauled or piped to the rig storage tanks or reserve pit from rivers, wells, reservoirs or private sources. Occasionally, water supply wells are drilled on or close to the drill site. Bentonite, a type of clay, is mixed with the water to form the main constituent of the drilling mud. A wide variety of other materials and chemicals may be added to enhance the mud properties. Drilling mud performs several important functions; it cools the bit, reduces the drag of the drill pipe on the sides of the bore hole, seals off any porous zones, aids in preventing an uncontrolled release of formation fluids, and carries the cuttings to the surface. High pressure air is sometimes used in place of mud. The use of mud or aid is largely dependent upon the target formation, drilling depth and type of completion desired. The drilling mud or air is circulated through the drill pipe to the bottom of the hole, through the bit and up the well bore. At the surface the mud and rock cuttings are returned to the reserve pit where gravity separates the two and they are mechanically separated through a screen. The mud is recycled and returned to the system for further use. When drilling with air the cuttings are blown into the reserve pit.

The actual commencement of the drilling is referred to as "spudding in". Initially, the drilling usually proceeds rapidly due to the consolidated nature of shallow formations.

Drilling is accomplished by rotating special bits bearing a controlled portion of the drill string weight. The rig structure and associated hoisting equipment bear the remainder of the drill string's weight. The weight on the bit is controlled to maintain as vertical a hole as possible or deviate from vertical as desired, and to prevent rapid wearing of the drill bit.

The combination of rotary motion and weight on the bit causes rock to be chipped away at the bottom of the hole. As mentioned earlier, these chips are then transported to the surface where they are disposed of into the reserve pit.

The rotary motion is created by a square or hexagonal rod, called a kelly, which fits through a square or hexagonal hole in a large turntable, called a rotary table. The rotary table sits on the drilling rig floor and as the hole is deepened the kelly descends. When the kelly has gone as deep as it can, it is raised and a piece of drill pipe about 30 feet in length is attached to the drill pipe in the hole. The drill pipe is then lowered, the kelley is raised and attached to the top of it, and drilling commences. By adding more and more drill pipe the hole is steadily deepened.

Eventually the bit becomes worn and must be replaced. To change bits, the entire string of drill pipe must be pulled from the drill string, then reassembled and again lowered into the hole and drilling is started again.

Drilling operations are continuous, 24 hours a day, seven days a week. The crews usually work three 8-hour shifts or two 12-hour shifts a day. At periodic intervals, BLM personnel, usually petroleum engineering technicians (PETs), will conduct inspections of the drilling rig and operations to ensure compliance with the approved plans in the APD. If at any time the operator wished to change the approved plans in the APD, verbal approval may be obtained but must be followed up in writing.

Upon completion of the drilling, the well is tested to determine its capability to produce hydrocarbons (oil and gas). If oil or gas is found in commercial quantities the well is completed as a producer. Installation of producing facilities generally requires little additional surface disturbances beyond that necessary for drilling. However, additional disturbance does result from pipeline and gathering line installations. Pumpjacks in this area are usually 8-10 foot in height and are usually situated over the well head on the same area where the drill rig was set up. Water disposal pits needed for the evaporation of water produced in association with hydrocarbons generally fit within the boundaries of the drilling pad. After the production facilities are installed, the remaining drilling disturbances are reclaimed.

During the production phase, BLM monitors and approves field activities needed for well and field operation and regulation. Many operations, e.g. plugging, completion in a different zone, deepening, etc., require prior approval. Others such as acidizing and fracturing do not require prior approval, but a subsequent report of operations describing the operations in detail must be filed.

If the well is not productive in commercial quantities it is considered a dry hole. Dry holes and producing wells which can no longer produce in commercial quantities must be plugged and abandoned.

Plugging and Abandonment

When a well is no longer capable of producing in paying quantities and has no other beneficial use, the well should be plugged and abandoned. Because each well is different, the plugging program for that well must be carefully designated. Federal minerals plugging programs are designed to:

a) Prevent fluid migration between zones

b) Protect mineral resources from damage

c) Isolate producing zones

After the physical plugging is completed, the surface is reclaimed, per stipulations in the APD or the surface owner agreement.

APPENDIX C

PANOCHE/COALINGA AREA OF CRITICAL ENVIRONMENTAL CONCERN GUIDELINES FOR OIL & GAS OPERATIONS IN T&E ANIMAL HABITAT

Maintain the existing ORV designations in the Panoche Hills area. Vehicles limited to designated routes.

Surface disturbing activities such as road construction, ground leveling, mining or oil and gas exploration and development will be evaluated for potential adverse impacts to these resources. An on-site field exam will be undertaken on all applications within the ACEC. Consultations with the U.S. Fish and Wildlife Service, in accordance with Section 7 of the Endangered Species Act, will be conducted if appropriate . If necessary protective measures will be taken. These measures can be separated into pre-development, development, and post-development. Such measures will be useful not only in evaluating oil and gas exploration (APDs, etc.) but also in developing mining plans of operations under the 3809 regulations. Not all measures will apply in every situation. Each surface disturbance action will be evaluated on a case by case basis for applicability of the following measures.

Pre-Development Protective Measures

- Installation of temporary fences along the margin of pad sites on oil and gas developments to eliminate off-site vehicle impacts to undisturbed habitat.

- Access roads and pipeline should be planed to utilize existing roads and trails. Where new roads are proposed, route to avoid sensitive habitat features such as shrubs, small mammal and rodent burrows and washes.

- Compensation both on-site and off-site: Rehabilitate additional acreage through reseeding, installation of artificial dens, closure/rehab of roads in other lease areas, etc.

- Seasonal restriction for operational activities to minimize vehicle traffic, noise, etc. during sensitive periods such as denning, nesting, etc.

- Formal programs to increase employee awareness of local wildlife concerns emphasizing unique habitat features and values. This is important to the contractor (s) as well as the applicant.

- Maintain unique or limiting topographic features (will vary from site to site).

- No surface occupancy should be considered in critical or sensitive habitat areas.

- Employees and contractors should be prohibited from carrying firearms onto the worksite.

Developmental Protective Measures

- Where pipelines/steam lines are needed, lay above ground (hang above ground across major washes). Align with roads where possible.

- Size and alignment (or orientation) of pads should be determined to minimize surface disturbance and habitat loss, yet accommodate construction activities (i.e.,lengthwise or parallel to existing roads, short side toward sensitive features). Revegetate those portions of the pads not needed for production purposes as soon as possible.

- Waste water should be properly contained and/or removed to a designated disposal site.

- Stockpile topsoil from surface disturbing activities to be used in conjunction with revegetation efforts.

- Maintain buffer zones around sensitive habitat features (minimum 200 feet from active or inactive San Joaquin kitfox dens, minimum 100 feet from all intermittent streams, 100 feet from dry washes in blunt-noses leopard lizard habitat and minimum 200 feet from giant kangaroo rat colonies). Fencing will be used if necessary.

- Keep number of roads to a minimum (one to two access points per well).

- Consolidate maintenance activities to reduce human disturbances.

- Fence/cover all existing and active sumps with fine wire mesh to prevent the entrapment of animals.

Post-Development Protection Measures

- Abandonments will be rehabed and re-contoured as close as possible to the original contour and condition. The determination for re-contouring abandoned well sites will consider possible impacts to RTE species. In some cases, where natural revegetation has occurred around the margins of well sites and RTE species are known to inhabit

the site, it may be desirable to rip and reseed pads and roads but avoid disturbing naturally revegetated areas by re-contouring.

- Ripping, reseeding and recontouring will be done by the lessee as approved by BLM to all roads, pads, sumps, and all other past surface disturbances (including oil spills from historic operations) not of value to the leasehold operation.

- Reseeding will consist of environmentally compatible plant species (saltbush) in all disturbed areas within construction zones, as well as any additional locations agreed to for the benefit of RTE species and surface protection from erosion.

- Specifications for seeding will include timeframes, rates of seed application, type of seed.

- Areas to be rehabilitated should be delineated in writing, by map, and staked/flagged on site.

- If in an active field, rehabilitation efforts should be conducted within one year after construction operations have ended.

- If necessary, fence (or block with physical barriers) revegetated sites from vehicular or livestock access.

- Dispose of all well site debris, including equipment, pipelines, and garbage in an acceptable manner (this means removal to a designated disposal site for contaminated soil and/or debris).

In addition to the protective measure listed above, compensation may be required in the form of on-site or off-site habitat enhancement (installation of guzzlers, conversion of oil and gas wells to water wells, seeding of native shrub species, etc.). Project applicants may be required to provide funds for purchase of off-site lands.

APPENDIX D

SPECIAL STATUS PLANT SPECIES WITH LOW POTENTIAL TO BE AFFECTED BY OIL & GAS ACTIVITIES

SPECIES	STATUS
Agrostis hendersonii	2
Allium hickmanii	1
Arctostaphylos cruzensis	2
Arctostaphylos edmundsii v. edmundsii	2
Arctostaphylos edmundsii v. parvifolia	2
Arctostaphylos montereyensis	2
Arctostaphylos pumila	2
Arctostaphylos pseudopungens	2
Astragalus ravenii	2
Astragalus tener v. titi	1
Atriplex vallicola	2
Calycadenia hooveri	2
Calyptridium pulchellum	2
Camissonia benitensis	T
Camissonia hardhamiae	2
Camissonia sierrae ssp alticola	2
Carpenteria californica	1
Ceanothus ferrisae	1
Chamaesyce hooveri	1
Chlorogalum purpureum purpureum	1
Chorizanthe pungens v. pungens	2
Cirsium fontinale v. campylon	2
Cistanthe pulchella	2
Clarkia rostrata	2
Collinsia antonina	2
Collomia rawsoniana	1
Cordylanthus mollis ssp hispidus	2
Cordylanthus nidularius	1
Cordylanthus palmatus	E
Cordylanthus rigidus ssp littoralis	2
Coreopsis hamiltonii	2
Cupressus goveniana	2
Cupressus macrocarpa	2
Delphinium hutchinsoniae	2
Ericameria fasciculata	2

Eriogonum butterworthianum	2
Eriogonum temblorense	2
Eriophyllum nubigenum	2
Eryngium racemosum	2
Eryngium spinosepalum	2
Erysimum menziesii ssp menziesii	1
Fremontodendron mexicanum	2
Fritillaria falcata	2
Fritillaria viridea	2
Gilia tenuiflora ssp arenaria	1
Galium californicum ssp luciense	2
Gratiola hetersepala	2
Helianthella castanea	2
Holocarpha macradenia	1
Ivesia unguiculata	-
Layia carnosa	1
Layia discoidea	2
Layia jonesii	2
Lewisia congdonii	3
Lupinus citrinus	2
Lupinus ludovicianus	2
Lupinus spectabilis	2
Lupinus tidestromii v. tidestromii	1
Malacothamnus abbottii	2
Malacothrix saxatilis v. arachnoidea	2
Microseris decipiens	2
Monardella leucocephala extinct?	1
Neostapfia colusana	1
Orcuttia inaequalis	1
Orcuttia pilosa	1
Orthocarpus campestris v. succulentus	2
Phacelia ciliata v. opaca	2
Phacelia phacelioides	2
Plagiobothrys hystriculus	2
Pogogyne clareana	2
Potentilla hickmanii	1
Pseudobahia bahiifolia	2
Pseudobahia peirsonii	1
Sanicula maritima	2
Sidalcea keckii	1
Streptanthus albidus ssp. albidus	1
Streptanthus callistus	2
Streptanthus hispidus	2
Streptanthus insignis lyonii	2

Trifolium polyodon	1
Trifolium trichocalyx	1
Tropidocarpum capparideum extinct?	2
Tuctoria greenei	1

SPECIAL STATUS PLANT SPECIES DEFINITIONS

Threatened or Endangered (T&E) - are those officially listed as threatened or endangered by the Secretary of the Interior under the provisions of the Endangered Species Act.

Candidate Species (C1, C2,) - are those species designated as Federal candidates (categories 1 and 2) for listing as threatened or endangered by the U.S. Fish & Wildlife Service.

State Listed Species - are those proposed for listing or listed by California in a category (rare, threatened, or endangered) implying potential endangerment or extinction.

Sensitive Species - are those designated by the California State Director of the BLM - typically these occur in small and/or widely dispersed populations - Panoche peppergrass may be considered as such in the near future so this EIS treats Panoche peppergrass as a special status species.

APPENDIX E

ENDANGERED SPECIES STIPULATION

All or part of the lands within this lease are within the range of one or more of the taxa identification attached to this list and/or endangered species (T&E). The BLM manager, through an environmental review process, and the U.S. Fish and Wildlife services (USFWS), through an ESA Section 7 comprehensive biological opinion, have determined that the action is not likely to jeopardize the continued existence of T&E species or result in the destruction or adverse modification of T&E critical habitat.

Therefore, prior to any surface disturbance activities, or even the use of vehicles off existing roads on this lease, BLM approval is required. This restriction also applies to geophysical activities for which a permit is required. The approval is contingent upon the results of site-specific inventories of the above T&E species in the critical. They must be environmental conditions. The lessee is hereby notified that the process are likely to take longer than the normal 30 days and that surface activity approvals may be delayed.

If no T&E species are found during the inventories, then no formal section 7 consultation with the USFWS will be necessary and the action will be processed using the standard Onshore Number 1 procedures. However, the lessee is hereby notified that, T&E species are found during the inventories, the surface distribution activities may be prohibited on portions of, or even all of the lease, unless an alternative is available that meets all of the following criteria: (a) the proposed actions is not to jeopardize the continued existence of the T&E species, (b) the proposed action is not likely to destroy or adversary modify critical habitat for the T&E species, and (c) the proposal actions are consisted with the recovery need on approved U.S. Fish and Wildlife Service recovery plans or BLM Habitat Management Plans. This denial authority will also apply to directional drilling proposals which require federal approval to drill into the leased mineral estate from adjacent lands.

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