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# PROPOSED CAMP SWIFT LIGNITE LEASING

Bastrop County, Texas

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DRAFT ENVIRONMENTAL IMPACT STATEMENT



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1980  
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S. Department of the Interior • Bureau of Land Management,  
New Mexico State Office • September, 1980

#### NOTICE

This draft environmental impact statement should be retained to be used in conjunction with the final environmental statement. The final statement will incorporate this document by reference and include the modifications and corrections which should be made to the draft as a result of public comment. The final statement will also include a record of public comments on this draft and the responses to those comments.



## United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
NEW MEXICO STATE OFFICE  
P.O. BOX 1449  
SANTA FE, NEW MEXICO 87501

Enclosed for your review and comment is the Draft Environmental Impact Statement (DEIS) for the proposed competitive leasing of lignite reserves at Camp Swift Military Reservation, Bastrop County, Texas. The document was prepared by the Bureau of Land Management (BLM), New Mexico State Office (Santa Fe, New Mexico), with assistance from the BLM Roswell District Office (Roswell, New Mexico).

This statement is based on information supplied by federal agencies, Texas state and local agencies, and interested private organizations and individuals. The purpose of the statement is to indicate the probable environmental, social, and economic impacts of the proposed action and alternatives and to ensure that these factors are considered along with land-use, technical, and other considerations in the decision-making process. In addition, the document contains a draft unsuitability assessment (Appendix 1) prepared as part of the Federal Lands Review to determine whether any lands may be unsuitable for surface coal mining (as defined by federal or state regulations). The unsuitability assessment will also be considered in the decision-making process.

The EIS was prepared in compliance with the Final CEQ Regulations. Consequently, only those resources for which potentially significant impacts were identified have been discussed in detail. Background material discussing impact to other resources is on file and available for inspection at six information centers in Texas (listed in Chapter Four of this EIS) and at the BLM New Mexico State Office, Division of Planning and Environmental Coordination, 509 Camino de Los Marquez, Santa Fe, New Mexico. Criteria for determining the significance of impacts for all resources are presented in Chapter Three (Environmental Consequences). Determination of significance was based on detailed impact analysis and an intensive scoping process.

I would appreciate receiving your comments on the environmental, social, and economic impacts of the proposed action and alternatives. The comment period will run for sixty (60) days after the DEIS is filed with the Environmental Protection Agency. All comments must be received no later than December 1, 1980.

Your written comments should be sent to:

State Director (922)  
Bureau of Land Management  
P.O. Box 1449  
Santa Fe, New Mexico 87501.

In addition the following public hearings have been scheduled:

Bastrop, Texas  
Old District Courtroom, Second Floor  
Bastrop County Courthouse  
Tuesday, November 18, 1980  
1:00 P.M. and 7:00 P.M.

Austin, Texas  
Radian Conference Room  
Radian Corporation  
8501 MoPac Blvd.  
Wednesday, November 19, 1980  
1:00 P.M.

San Antonio, Texas  
Commerce Room  
National Bank of Commerce Annex  
430 Soledad Street  
Thursday, November 20, 1980  
1:30 P.M.

Written requests to testify should be submitted to the State Director at the above address by November 10, 1980. People who indicate they wish to testify when they check in at the hearing room may also have an opportunity to testify after the pre-registered speakers have been heard. All speakers will be limited to a maximum of ten (10) minutes each.

Written comments received by December 1, 1980, and testimony presented at the public hearings will be fully considered in preparation of the Final Environmental Impact Statement (FEIS). Those comments which pertain to the adequacy of the impact assessment or present new data will be addressed in the FEIS. Comments received after December 1, 1980, will be considered in the subsequent decision process.

Sincerely yours,

*Tony L. Woodard*  
State Director

ID: 88056998

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DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

DRAFT  
ENVIRONMENTAL IMPACT STATEMENT

PROPOSED CAMP SWIFT LIGNITE LEASING

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*Larry J. Woodard*  
State Director, New Mexico



Camp Swift Coal Lease Application  
Environmental Impact Statement

Draft (X)                      Final ( )

The United States Department of the Interior, Bureau of Land Management

1. Type of Action:                Administrative (X)                Legislative ( )
  
2. Abstract:                      Under regulations of the Federal Coal Management Program (43 CFR 3425.1-6), the Bureau of Land Management (BLM) proposes to offer for competitive lease approximately 6,600 acres containing 80 to 100 million tons of federally-owned lignite reserves at Camp Swift Military Reservation, Bastrop County, Texas. The environmental impacts of the proposed action (preferred alternative), a larger area alternative (6,700 acres), and the no action alternative (no leasing) are analyzed in this EIS. The proposed action was formulated in response to a hardship coal lease application submitted to the BLM New Mexico State Office by the Lower Colorado River Authority of Austin, Texas. The lignite would be used for the generation of electricity for sale to the public in Texas. The impact analysis determined significant impacts to be incurred in the areas of mineral resources, air quality, soils, hydrology, land use, the social/economic conditions (taxation and growth/no growth issues), and noise. Impacts were judged to be nonsignificant for vegetation and wildlife, cultural resources, social/economic conditions (population and infrastructure), geology (other than mineral resources), and transportation.
  
3. Comments have been requested from the following:  
                                   See attached list.
  
4. Contact for further information on the EIS:  
                                   Carol A. MacDonald  
                                   Bureau of Land Management  
                                   New Mexico State Office  
                                   P. O. Box 1449  
                                   Santa Fe, New Mexico 87501  
                                   Telephone:   Commercial (505) 988-6214  
   FTS                                     476-1214
  
5. Date filed with EPA:  
                                   Draft:  
                                   Final:
  
6. Comments on the draft statement must be received no later than:  
                                   December 1, 1980

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| Bastrop County, Texas             | City of Elgin, Texas      |

MAJOR SPECIAL INTEREST GROUPS

|                                     |   |
|-------------------------------------|---|
| Committee for Wild Basin Wilderness | League of Women Voters                              |
| Sierra Club                         | Texas Committee on Natural<br>Resources             |
| Texas Environmental Coalition       | Travis Audubon Society                              |
| We Care Austin                      | Bastrop, Elgin, Smithville,<br>Chambers of Commerce |

OTHER ORGANIZATIONS AND INDIVIDUALS

Numerous organizations and individuals expressing interest in the proposed action have been sent copies of this statement and have been invited to comment.

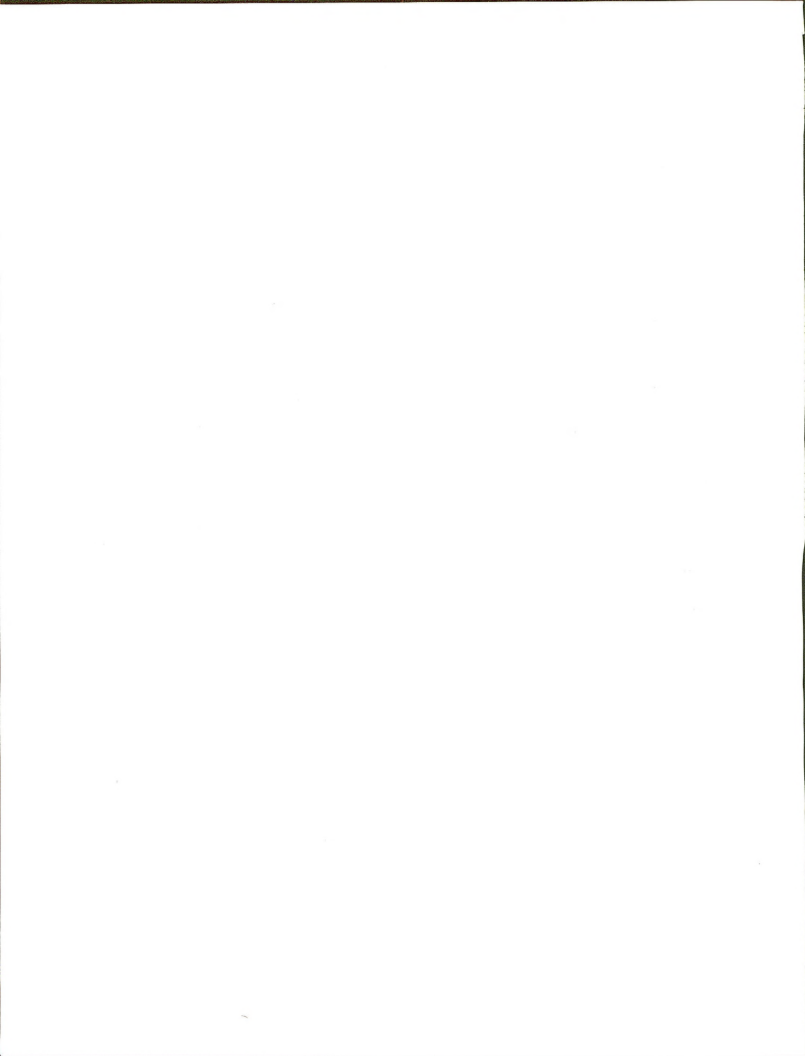


|   | <u>Page</u> |
|---|-------------|
| <b>SUMMARY</b>  | xi          |
| <b>CHAPTER ONE - PROPOSED ACTION AND ALTERNATIVES</b> |             |
| Introduction  | 1-1         |
| Purpose and Need                                      | 1-1         |
| Scope of the Environmental Impact Statement           | 1-4         |
| Objectives  | 1-4         |
| Level of Analysis                                     | 1-4         |
| EIS Area  | 1-4         |
| The Proposed Action                                   | 1-4         |
| Description   | 1-4         |
| Mitigating Measures                                   | 1-5         |
| Operational Models                                    | 1-6         |
| The Larger Area Alternative                           | 1-14        |
| Description   | 1-14        |
| Mitigating Measures                                   | 1-14        |
| Operational Models                                    | 1-14        |
| No Action Alternative                                 | 1-14        |
| Alternative Not Analyzed in the EIS                   | 1-15        |
| Regulatory and Planning Controls                      | 1-15        |
| Regulatory Controls                                   | 1-15        |
| Authorizing Action                                    | 1-15        |
| Further Environmental Assessment Points               | 1-15        |
| Relationship to Land Use Planning                     | 1-15        |
| Texas Land Use Plan                                   | 1-15        |
| Related Activities                                    | 1-18        |
| Recommendations                                       | 1-21        |
| Paleontology  | 1-21        |
| Vegetation/Wildlife                                   | 1-21        |
| Soils   | 1-21        |
| Hydrology   | 1-22        |
| Land Use  | 1-22        |
| Transportation  | 1-22        |
| Socioeconomic   | 1-22        |
| Noise   | 1-22        |
| <b>CHAPTER TWO - AFFECTED ENVIRONMENT</b>             |             |
| Introduction  | 2-1         |
| Geology   | 2-1         |
| The Lignite Resource                                  | 2-1         |

|   |      |
|---|------|
| Soils   | 2-1  |
| Air Quality   | 2-3  |
| Hydrology   | 2-4  |
| Groundwater   | 2-4  |
| Surface Water   | 2-7  |
| Land Use  | 2-12 |
| Visual Resources  | 2-12 |
| Social and Economic Environment: Taxes and Royalties                              | 2-16 |
| The Growth Issue  | 2-16 |
| The Fiscal Issue  | 2-16 |
| Existing Taxes in Bastrop County  | 2-16 |
| Noise   | 2-17 |
| Levels and Sources  | 2-17 |
| Time of Day, Season of Year   | 2-17 |
| Noise Receptors   | 2-17 |
| <b>CHAPTER THREE - ENVIRONMENTAL CONSEQUENCES</b>                                 |      |
| Introduction  | 3-1  |
| Criteria Used In Determination of Impact Significance                             | 3-1  |
| Geology/Paleontology/Mineral Resources  | 3-1  |
| Soils   | 3-1  |
| Climate   | 3-1  |
| Water   | 3-4  |
| Vegetation and Wildlife   | 3-4  |
| Cultural Resources  | 3-4  |
| Land Use  | 3-4  |
| Social and Economic Environment   | 3-4  |
| Transportation  | 3-5  |
| Noise   | 3-5  |
| Short Term and Long Term  | 3-5  |
| Net Energy Analysis   | 3-5  |
| Energy Costs of Camp Swift Lignite Mining   | 3-5  |
| Energy Costs of Lignite Mine - Power Plant System                                 | 3-5  |
| Comparison of Energy Costs of Lignite Development<br>with Other Coal Alternatives | 3-5  |
| Proposed Action   | 3-5  |
| Geology: Lignite Resources  | 3-5  |
| Soils   | 3-6  |
| Air Quality   | 3-8  |
| Hydrology: Groundwater  | 3-10 |
| Hydrology: Surface Water  | 3-16 |
| Land Use  | 3-18 |
| Social and Economic Environment   | 3-19 |
| Noise   | 3-20 |
| Larger Area Alternative   | 3-25 |
| Recommendations   | 3-25 |
| No Action Alternative   | 3-25 |
| Cumulative Impacts  | 3-26 |
| Texas Lignite Development Forecasts   | 3-26 |
| Cumulative Environmental and Socioeconomic Impacts                                | 3-26 |

## **CHAPTER FOUR - CONSULTATION AND COORDINATION**

|                            |             |
|----------------------------|-------------|
| The Scoping Process        | 4-1         |
| Scoping Meetings           | 4-1         |
| Public Information Files   | 4-1         |
| Agencies Consulted         | 4-1         |
| Federal                    | 4-1         |
| Texas                      | 4-2         |
| Federal (additional)       | 4-2         |
| State (additional)         | 4-3         |
| Preparers and Contributors | 4-3         |
| BLM/NMSO                   | 4-3         |
| Radian Corporation         | 4-4         |
| <b>GLOSSARY</b>            | <b>G-1</b>  |
| <b>BIBLIOGRAPHY</b>        | <b>B-1</b>  |
| <b>APPENDIX 1</b>          | <b>A1-1</b> |
| <b>APPENDIX 2</b>          | <b>A2-1</b> |
| <b>APPENDIX 3</b>          | <b>A3-1</b> |
| <b>APPENDIX 4</b>          | <b>A4-1</b> |
| <b>APPENDIX 5</b>          | <b>A5-1</b> |
| <b>APPENDIX 6</b>          | <b>A6-1</b> |
| <b>APPENDIX 7</b>          | <b>A7-1</b> |
| <b>INDEX</b>               | <b>I-1</b>  |



## SUMMARY

This Draft Environmental Impact Statement (DEIS) has been prepared in response to a hardship coal lease application (NM A-29640, 1 December 1976) from the Lower Colorado River Authority (LCRA) of Texas. The LCRA application included the City of Austin, Texas as a joint applicant. A second coal lease application (NM A-29642) was also submitted to BLM on 1 December 1976 by the San Antonio City Service Board.

The applications were for leasing the lignite coal beneath Camp Swift, a U.S. Department of Army (DOA) military reservation in Bastrop County, Texas. The Bureau of Land Management, New Mexico State Office (BLM/NMSO) is the lead agency responsible for determining if the acquired military lands may be competitively leased for lignite surface mining under applicable federal requirements. The DEIS is prepared as part of the requirements for making that determination. The Assistant Secretary of the Interior for Land and Water Resources will make the final decision concerning leasing of Camp Swift lignite, based on environmental and socioeconomic analysis contained in the EIS, land use, technical, and regulatory considerations.

Alternatives identified in the DEIS process include the Proposed Action (preferred alternative) of leasing approximately 2670 hectares (6600 acres); a Larger Area Leasing Alternative, taking in approximately 2710 hectares (6700 acres); and a No Action Alternative (defined as rejection of the lease application).

DOA, the surface management agency for Camp Swift currently leases the reservation (including the proposed lease area) to the Texas Army National Guard (TANG) for periodic military training activities. Few structures or roads exist on the proposed lease area, although the University of Texas System Cancer Center maintains their veterinary unit in the area included in the Larger Area Leasing Alternative. Camp Swift is otherwise situated in a low-density rural setting.

The process of preparing this DEIS began with a series of "scoping" meetings. These sessions helped BLM identify agency and public concerns regarding the leasing and mining of Camp Swift lignite. Primary public concerns revealed in the scoping meetings centered around involvement in the EIS process, how leasing decisions are made, potential for success of post-mining reclamation, potential health effects, and the protection of state and local interests -- including tax benefits and royalty payments.

Economic benefit to Bastrop County as a result of leasing and mining Camp Swift lignite is examined in the DEIS. BLM research indicates that Congressional and state legislative actions would be required to enable royalty payments to be made to the State of Texas. Receipt of benefits in Bastrop County would require action at the state level. Moreover, the lease is available by

law only to publicly owned utilities. These entities are tax exempt.

Other areas of public concern are: the potential impact of mining on water resources, future use of the reclaimed area, and the potential for impact on the adjacent facility of the U.T. Cancer Center.

Chapter One of this DEIS includes mitigation measures and recommendations designed to relieve adverse impacts. The mitigation measures are proposed as lease stipulations, reducing the number and significance of impacts discussed in Chapter Three.

Additional objectives of Chapter One are to describe the proposed action and alternatives in detail, to provide background information on the regulatory context for understanding the application and leasing procedure, to set forth the objectives of the DEIS, to define the study area and level of analysis, and to discuss land use plans which pertain to Camp Swift.

Chapter Two describes the affected environment for each component (e.g., Air Quality, Soils) for which a potential significant impact has been identified.

In Chapter Three the criteria are described by which the significance of impacts were judged on each component. The assumptions and guidelines used in analyzing impacts, the short- and long-term beneficial and adverse impacts anticipated, and recommendations for dealing with unavoidable adverse impacts are also presented. Only significant impacts of the proposed action and alternatives are discussed in detail. Background material on analysis of all other impacts is on file and may be inspected at BLM/NMSO, Division of Planning and Environmental Coordination, 509 Camino de los Marquez, Santa Fe, New Mexico, or at any one of six public information files in Texas (listed in Chapter Four).

A potential was determined for significant impacts to be incurred in the areas of mineral resources, air quality, soils, hydrology, land use, the social/economic environment (taxes and royalties), and noise. Explanation of the factors causing these to be significant is also included in Chapter Three. An overall "Cumulative Impacts" discussion is presented at the end of the chapter. Findings by component area are described in the following paragraphs and displayed in Table S-1 at the end of the Summary.

### Geology: The Lignite Resource

The lignite underlying Camp Swift occurs in the Calvert Bluff formation. The lignite bearing strata con-

tain an estimated 70 to 90 million metric tons (80 to 100 million short tons) of lignite recoverable by surface mining methods.

Mining of the Camp Swift lignite would take about 25 percent of the estimated recoverable lignite resource in Bastrop County.

## Soils

Nineteen soil phases and nine soil series occur in the study area. None of these units meet the Office of Surface Mining Control and Reclamation criteria for prime farmland classification.

The soils are typified by a thin, fine sand or fine sandy loam to loam horizon overlying a somewhat dense sandy clay loam to clay loam. The major potential problems with post mining soil management and revegetation are erosion control, maintenance of soil fertility and conservation of soil moisture.

The Axtell, Crockett, and Wilson soil series, which comprise about 68 percent of the study area, are highly erodible. All other soil series are moderately erodible. A site-specific and detailed erosion control plan should be developed prior to mine permit application. Emphasis should be given to controlling erosion from newly graded surfaces.

Potential mixing of overburden with topsoil may have uncertain effects on post-reclamation soil fertility. Overburden material is expected to have a fairly low fertility and poor structure as well as high potential for erosion. A detailed assessment of overburden characteristics should be made before alternative soil management and handling plans are proposed.

Disturbance of the subsurface may have beneficial impacts on soil physical conditions, especially where a pronounced "clay pan" is present. Potential beneficial impacts include the improvement of tilth and infiltration capacity. These would result in deeper root penetration and water infiltration.

## Air Quality

The proposed lease area presently has no violations of the National Ambient Air Quality Standards (NAAQS).

The annual and 24-hour air quality impacts from the proposed leasing action were assessed using the results of atmospheric dispersion modeling. Annual suspended particulate matter concentrations were calculated to exceed 75 percent of the secondary NAAQS and 75 percent of the annual Prevention of Significant Deterioration (PSD) increment along the haul road for the truck transportation option. Twenty-four hour concentrations calculated along the haul road were estimated to exceed the secondary NAAQS and the 24-hour PSD increment.

During those years that mining activities, and their resultant particulate emissions, are centered within a few kilometers of the site boundaries, the secondary annual and 24-hour NAAQS and the annual and 24-hour PSD increments may be exceeded in areas outside the lease area.

## Hydrology

### Groundwater

The major aquifers of concern in the proposed lease area are in the Simsboro and Calvert Bluff Formations. Outcrops of the sand in these formations are groundwater recharge zones.

The Simsboro aquifer is the most important and productive aquifer underlying the Camp Swift area. Most industrial and municipal wells in the area are completed in the Simsboro. The Calvert Bluff aquifers overlie the Simsboro. The Simsboro and Calvert Bluff sands may be hydraulically connected in the subsurface.

The proposed lease action could cause several impacts on the groundwater resources of the Camp Swift lease area. Potential groundwater impacts are both short-term (concurrent with mining operations) and long-term (extending beyond the life span of the mine).

Potential short-term impacts consist mostly of changes in the quality of water in the aquifer system. As a result of mining operations, groundwater is expected to be withdrawn from the aquifer system. This withdrawal may be caused by seepage of water along the highwall and/or relief of artesian pressures in the Simsboro Sand beneath the mine floor. Based on a "worst-case" analysis designed to predict the maximum amount of groundwater withdrawal, groundwater discharge from the mine is estimated at 1,500 liters per second (24,000 gallons per minute). Although potential decline of groundwater level in the Simsboro aquifer may extend beyond the boundary of the proposed lease area, deep industrial and municipal water wells will probably not be adversely affected.

The proposed leasing action may result in minor long-term deterioration of groundwater quality. Calvert Bluff aquifers adjacent to the lease area may experience water quality problems due to infiltration of water from the mine pit. Recharge of mine drainage waters to the Simsboro aquifer is likely to be small, and no severe deterioration of groundwater quality is anticipated.

### Surface Water

The proposed lease area lies entirely in the Colorado River Basin. Primary drainage is provided by Big Sandy Creek, a perennial tributary of the Colorado River, and McLaughlin and Dogwood Creeks, both intermittent tributaries of Big Sandy. Estimated average flows for Big Sandy, McLaughlin, and Dogwood Creeks are 0.57

cubic meters per second (20 cubic feet per second), 0.12 cubic meters per second (4.3 cubic feet per second), and 0.07 cubic meters per second (2.3 cubic feet per second), respectively. Although water quality in Big Sandy and Dogwood Creeks is generally good, suspended solids levels are somewhat high.

The major impact of the proposed action on surface water will be approximately a tenfold increase in the estimated median flow of Big Sandy Creek, attributable to discharge of water produced by mine dewatering. The potential effects of this increased flow include: Increased streambed erosion, increased carrying capacity for sediment, higher base flows and a potential for increased downstream water use. Surface water quality is not expected to be adversely affected as a result of the proposed action.

#### **Land Use**

Land use at Camp Swift is organized around military functions. The proposed lease area and site environs are predominately open, and also used by TANG for military training within the Camp Swift boundary. There are scattered low-density residential areas in the unincorporated region around Camp Swift. Bastrop, Elgin, Butler, and McDade are the closest towns.

The University of Texas System leases a tract of land in the south end of the military reservation for operation of its Cancer Center animal rearing facility.

Impacts discussed in this EIS would be significant to land use on a 56-acre tract leased by the Cancer Center. Adverse land use impacts would be caused by the Larger Area Alternative unless provision is made for relocation of the Center's operation.

#### **Social and Economic Environment**

Surface mining and growth impacts resulting from lignite development are issues of concern to local residents and officials in Bastrop County. These concerns are heightened by the absence of legal mechanisms allowing tax revenues or production royalties to be paid to the County. Receipt of tangible economic benefits to the County, in addition to wages of a mine work force comprised of local residents and in-migrants, would reduce the basis for these concerns.

#### **Noise**

Primary concerns over noise impacts are associated with potential effects on the behavior of chimpanzees located within the adjacent U.T. Cancer Center facility. Noise levels could conceivably approach 65 dB as a result of nearby mining activities. The degree of impact of the non-human primate research is unknown; but humans are known to be highly sensitive to this level of noise.

#### **Larger Area Alternative**

Overall, impacts which would result from the Larger Area Alternative are not substantially different from those which would result from the Proposed Action. The Larger Area Alternative is 40 hectares (100 acres) more than the Proposed Action. Impacts would be proportionately the same.

The Larger Area Alternative would yield 2.4 million metric tons (2.7 million short tons) of additional lignite from mining. It would also require the mining of the area now being used for grazing animals used in scientific research by the U.T. Cancer Center.

#### **No Action Alternative**

Under the No Action Alternative, the lease application would be rejected and the lignite at Camp Swift would not be available for generating electricity. TANG could continue use of the area for military training, and current natural resources, cultural resources, land uses, and constraints would continue to follow existing trends. Current social and economic trends would continue, and the \$2.4 million annual mining payroll would not be available to the county.

#### **Non-Significant Impacts**

Impacts were judged to be non-significant for paleontology, vegetation and wildlife, cultural resources, socioeconomic conditions (other than taxes and royalties issues), and transportation.

Paleontological resources, although largely removed, are considered small in extent when compared to the total lignite resource. No unique paleontological resources are expected to be located in the Camp Swift lease area.

Vegetation on the rolling topography of Camp Swift is predominantly Post Oak Savannah. Some cleared areas have been used for grazing. Wildlife and habitats are typical of the Post Oak Savannah. No federal or state threatened or endangered plant or animal species are known to occur on Camp Swift.

Environmental impacts would consist of removal of the vegetative cover of affected areas. Species associated with them would be lost, but the impact on these resources overall would not be large. The same conditions, habitats, and species occur extensively elsewhere in the Post Oak Savannah of Texas.

Cultural resources inventoried at Camp Swift reflect a pattern of human usage through time. The information they contain could help in understanding prehistory and early history of the area. Before approval of a mining plan, the lessee will be required by BLM to submit a

cultural resource management plan which would provide for recovery of the information values of the cultural resources in the proposed lease area.

Social and economic conditions of Bastrop County are reflective of its predominately rural and low to moderate income nature. The county population in 1970 was 17.5 percent elderly (compared to the national average of 10 percent). Rural subdivision growth during the 1970s probably has brought younger immigrants, lowering the percentage of elderly closer to the norm.

Educational attainment and income historically have been less for Bastrop County than for Texas. Black and Hispanic households show a higher proportion in poverty than do Anglo households in the county.

In terms of public services and facilities, they are most concentrated in the incorporated cities of Bastrop, Elgin, and Smithville. Water systems exist in unincorporated areas, but sewage collection and treatment systems are confined mainly to more densely settled communities.

Schools in the area are generally adequate. Health services, while statistically low for the county, are supplemented by proximity to Austin.

Impacts from the workforce associated with Camp Swift lignite development would be relatively small when allocated among area communities. No significant strain on services and facilities would be likely. Mining would make a minor contribution to existing growth trends in Bastrop County. The elderly on fixed income could be moderately affected by general growth pressures and price increases.

The transportation system, consisting mainly of F.M. 2336, U.S. 290, and State Highway 95, would not receive substantial traffic increases as a result of the proposed action. No congestion exists presently.

The Southern Pacific and Missouri-Kansas-Texas Railroads pass near Camp Swift. The M-K-T is the most likely line, due to its good condition and other supporting factors, to bear what impacts would occur from the proposed action if lignite from Camp Swift were transported to end use by rail.

Chapter Four contains a summary of the issues and questions raised in scoping meetings. It also lists the federal, state, and local agencies consulted regarding the proposed leasing, and the preparers of the DEIS.

The following summary table presents a brief description of major impact categories and resulting estimated impacts that would occur from the proposed leasing action and alternatives.



**TABLE S-1**  
**SUMMARY OF MAJOR IMPACTS RESULTING FROM DEVELOPMENT**  
**OF PROPOSED CAMP SWIFT LEASING**

| Environmental Component | Impacts are considered significant if:  | Statement of Impact  |  | Impact Determination Not Significant | Significant |
|-------------------------|---|--|--|--------------------------------------|-------------|
|                         |   | Proposed Action  | Larger Area Alternative  |                                      |             |
| Geology                 | Land disturbance results in observably different conditions from surrounding features, creates a hazard or destroys a particularly valuable geologic resource   | Removal of 90 million short tons of lignite  | Removal of an additional 2.7 million short tons over Proposed Action       |                                      | ●           |
| Soils                   | There would be greater than normal loss of soil productivity despite reclamation and recovery   | On 4000 acres, increased erosion and loss of already limited topsoil would occur; natural structure and productivity would change  | On an additional 100 acres, comparable impacts to those in Proposed Action |                                      | ●           |
| Climate                 | There would be a change in microclimate greater than 30% or in regional/local climate greater than 5%   | Change between 10 and 30% in microclimate; under 2% in regional/local climate  | Comparable impacts to Proposed Action                                      | ●                                    |             |
| Air Quality             | Generation of air pollutants exceeding 75% of Natural Ambient Air Quality Standards (NAAQS) or Prevention of Significant Deterioration (PSD) increment  | The 24-hour PSD increment (37mg/m <sup>3</sup> ) for particulates would be exceeded by twofold   | Comparable impacts to Proposed Action                                      |                                      | ●           |
| Groundwater             | There would be deterioration of groundwater quality; there would be physical disruption of aquifers   | Quantity of water in aquifer systems would be altered; quality for consumptive uses could be threatened; withdrawal of 24,000 gallons per minute could deplete near-surface aquifer system | Comparable impacts to Proposed Action                                      |                                      | ●           |
| Surface Water           | There would be large scale changes resulting in violation of federal or state water quality standards; stream flows were reduced to levels affecting downstream use, flooding, or waste assimilation; excessive demands were placed on municipal facilities; stream flows increased enough to result in notable changes | Lease area stream flow would be increased tenfold to approximately 56 cubic feet per second  | Comparable to Proposed Action  |                                      | ●           |
| Cultural Resources      | There would be damage or destruction of historic or prehistoric sites of scientific or cultural value   | Sites in 6600 acres and disturbed peripheral areas would be salvaged. Integrity of sites would be lost; information in sites would be recovered  | Comparable to Proposed Action  | ●                                    |             |

**TABLE S-1**  
**SUMMARY OF MAJOR IMPACTS RESULTING FROM DEVELOPMENT**  
**OF PROPOSED CAMP SWIFT LEASING**  
**(continued)**

| Environmental Component         | Impacts are considered significant if:  | Statement of Impact   |  | Impact Determination Not Significant | Impact Determination Significant |
|---------------------------------|---|---|--|--------------------------------------|----------------------------------|
|                                 |   | Proposed Action   | Larger Area Alternative  |                                      |                                  |
| Vegetation and Wildlife         | There would be removal of resources of high ecological, aesthetic or recreational value and if such removal could not be satisfactorily mitigated; there were threatened and endangered species present in the lease or peripheral areas  | Approximately 4000 acres of common Post Oak Savannah would be removed; long-term recovery is highly probably. No threatened and endangered species are known to be present            | Comparable to Proposed Action; additional 100 acres disturbed                      |                                      | ●                                |
| Land Use                        | Direct disruption of a valuable existing land use or substantial increase in demand for developed land uses, and/or distinct conflicts with existing land use plans of local government. Visual impacts exceed visual resource standards. | Under one transportation scenario, a rail loop requiring about 500 acres could significantly disrupt land use near its location. Visual standards could be exceeded for a short-term. | Comparable to Proposed Action; also disruption of use on U.T. System 56-acre lease |                                      | ●                                |
| Social and Economic Environment | Greater than 10% sustained annual population increase; creation of serious housing shortages or overloading of community facilities; inadequate tax or royalty revenues to pay for growth costs.  | Project is exempt from all local taxes.   | Comparable to Proposed Action  |                                      | ●                                |
| Transportation                  | There would be occurrence of at least 40% increase in usage of any off-site transportation facility.  | No transportation facilities would experience increase in usage exceeding 40%.  | Comparable to Proposed Action  |                                      | ●                                |
| Noise                           | Human receptors are exposed to equivalent day-night sound levels exceeding 55 decibels.   | Human receptors located near the periphery of Camp Swift would experience short-term exposure to day-night equivalent noise levels exceeding 55 decibels.                             | Comparable to Proposed Action; greater impact on U.T. System Cancer Center         |                                      | ●                                |

## CHAPTER ONE PROPOSED ACTION AND ALTERNATIVES

### INTRODUCTION

The proposed action (preferred alternative) analyzed in this Draft Environmental Impact Statement (DEIS) is to offer for competitive lease approximately 2,670 hectares (6,600 acres) containing federally-owned lignite reserves at Camp Swift Military Reservation, Bastrop County, Texas. In addition, the EIS assesses two alternatives: the no action (no leasing) alternative and the larger area leasing alternative involving approximately 2710 hectares (6,700 acres). The location of Camp Swift and the proposed lease areas may be seen on Maps 1-1 and 1-2.

The proposed action and alternatives were formulated under the authority of the coal management regulations (43 CFR 3400) of the Department of the Interior (DOI) and the Federal Coal Leasing Amendments Act of 1976, as amended. Section 12 of that Act would limit competitive bidding to Texas governmental entities which produce electricity for sale to the public within the State of Texas.

Management authority for Camp Swift is divided between the Department of the Army (DOA) and the DOI's Bureau of Land Management (BLM). DOA is the surface-management agency, while BLM manages the mineral estate. Accordingly, this EIS was prepared by BLM, in consultation with DOA.

DOA consented to leasing in a letter from the Office of the Assistant Secretary (DOA) dated 31 August 1978. DOA has been delegated authority by the Secretary of Defense to consent to mineral leasing on acquired military lands.

An estimated 70 to 90 million metric tons (80 to 100 million short tons) of lignite are recoverable from Camp Swift by conventional surface mining. Additional background information and descriptions of the proposed action and alternatives are provided in subsequent sections of this chapter.

### PURPOSE AND NEED

The proposed action and alternatives were formulated in response to a hardship coal lease application from the Lower Colorado River Authority (LCRA) of Austin, Texas. The LCRA application (NM A-29640) was submitted to BLM on 1 December 1976. It was amended 10 January 1977 to include the City of Austin, Texas as a joint applicant. A second coal lease application (NM A-29642) was also submitted to BLM on 1 December 1976 by the San Antonio City Service Board of San Antonio, Texas.

LCRA's application cited a pressing need for the Camp Swift lignite as the result of the following conditions:

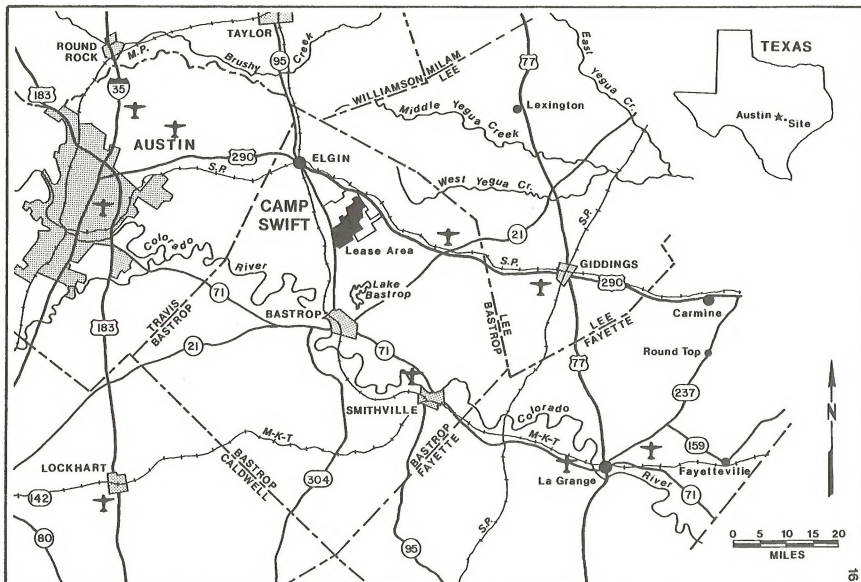
1. Fuel orders by the Texas Railroad Commission (TRC) curtailing by 1981 the use of natural gas (currently a major boiler fuel) by electrical utilities in Texas to 90 percent of the 1975 level of actual consumption and then to 75 percent by 1985.
2. A projected continuation of the existing seven percent annual increase in electrical demand within the area serviced by LCRA and the City of Austin into the 1980s and 1990s.
3. The 1984 expiration date of LCRA's gas supply contracts with Coastal States Gas Corporation (Lo-Vaca Gathering Company) and litigation concerning Lo-Vaca's inability to deliver natural gas to its customers at the contracted price.

Since submittal of the applications in 1976, one of the conditions cited above has changed but did not result in alleviation of hardship conditions. The Texas Railroad Commission rescinded its orders restricting the use of natural gas because of the 1978 Fuel Use Act for several utilities having no immediately available alternative fuel source.

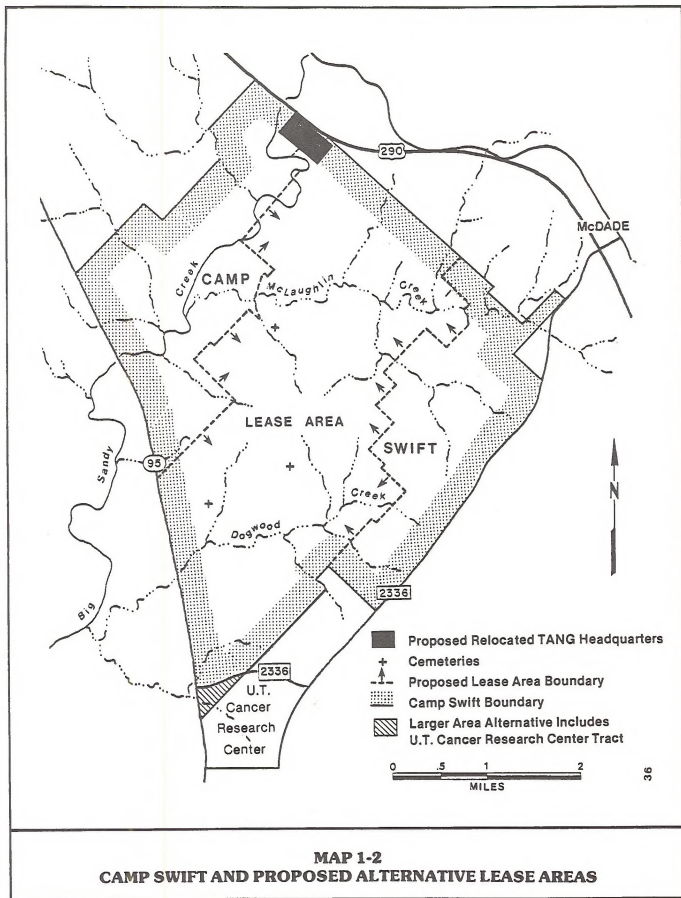
LCRA maintains that the need for a new reliable fuel source continues to be a pressing issue as a result of the Power Plant and Industrial Fuel Use Act of 1978. This legislation virtually prohibits the use of natural gas in newly constructed power plants and mandates the abandonment of natural gas as a base-load fuel for electric power generation after 1990. Furthermore, although settlement has been reached between LCRA and Coastal States Gas Corporation, the gas delivery contract will still expire in 1984 and is not expected to be renewed.

On 27 September 1977, a court order in the case of *NRDC vs. Hughes* prohibited BLM from taking any steps to lease federal coal. As a result of that court order, processing of coal lease applications for the Camp Swift lignite reserves was stopped. However, by amended court order of 14 June 1978, BLM was authorized to process eight specific coal lease applications; among these was the LCRA application (NM A-29640) for the Camp Swift area. Each of the pending leases was considered to have special circumstances of "hardship" which justified its exemption from the original injunction against federal leasing.

On 19 July 1979, the injunction on federal coal leasing was lifted when DOA published and made effective regulations for federal coal leasing under 43 CFR 3400.



**MAP 1-1  
PROJECT VICINITY**



Subsection 3425.1-6, Hardship Leasing, authorized the Secretary of the Interior to issue a competitive coal lease based on any application listed by serial number in the amended court order of 14 June 1978.

## SCOPE OF THE ENVIRONMENTAL IMPACT STATEMENT

### Objectives

This DEIS was prepared in response to the National Environmental Policy Act of 1970 (NEPA) and in accord with the Final Regulations and Procedural Provisions of the Council on Environmental Quality (CEQ). The DEIS has three major objectives:

1. To assess the impacts of the proposed action and any reasonable alternatives as required by NEPA and CEQ.
2. To identify major issues or data requirements which may need to be addressed before a site-specific mining and reclamation plan could be approved.
3. To carry out the first steps in the Federal Lands Review (unsuitability assessment) required for any federal leasing action (discussed in more detail in the Land Use Planning section at the end of this chapter).

### Level of Analysis

The BLM is using a tiering of actions to permit environmental analysis at all stages of leasing and mining, with minimal duplication, in keeping with CEQ directives. An EIS addressing implementation of the federal coal leasing program has been prepared (USDI 1979, INT "FES" 79-19). A statement for a regional program encompassing the Camp Swift area is not needed: there is insufficient federal land in the State of Texas to which a federal regional leasing program is applicable.

This EIS examines alternative leasing actions and is not intended to analyze the suitability of site-specific mining and reclamation plans. If the area is leased, the lessee must then submit a site-specific mining and reclamation plan to the Office of Surface Mining (OSM) within three years. Such a plan must comply with all applicable federal regulations before it can be approved, and the lessee cannot mine the lignite until that plan has been approved. Additional environmental analysis will also be required before a plan is approved.

Operational models used in the generic analysis in this DEIS are intended to illustrate possible methods for developing the federal coal reserves at Camp Swift. They are not intended to represent the applicant's or other bidder's proposed activities, even though the models are partly based on information supplied by LCRA. Site-specific plans cannot be fully developed until a lessee has

extensively investigated subsurface conditions at Camp Swift. Use of LCRA's data does not imply the LCRA would be given any preference if a lease sale is held.

### EIS Area

The proposed lease area is limited to 2,670 hectares (6,600 acres) of Camp Swift. Bastrop County, Texas is the EIS study area analyzed in the DEIS. This geographic division encompasses the units of government and the economic community most readily susceptible to impacts directly arising from the federal leasing action or alternatives. Bastrop County also encompasses sufficient area to include functional units of the natural environment such as watershed, physiographic units, geomorphic units, plant communities, animal populations, and other environmental components to permit completion of a comprehensive analysis. The cities of Austin and San Antonio are sufficiently large and removed from the site that leasing would have no detectable impact other than perhaps on the potential for relief from rising utility rates and improved reliability on electrical power delivery. Such an assessment is beyond the scope of this EIS because the successful bidder(s) for the lease is not determined.

## THE PROPOSED ACTION

### Description

The proposed action (preferred alternative) addressed in this DEIS is to offer for competitive leasing approximately 2,670 hectares (6,600 acres) of federally-owned lignite reserves underlying the Camp Swift Military Reservation in Bastrop County, Texas. The proposed lease area excludes from the application area certain tracts which have been identified in the Federal Lands Review (unsuitability assessment) being performed by BLM (see Map 1-2). Before the area can be offered for competitive lease sale, the following four determinations must be made.

1. The U.S. Geological Survey (USGS) must designate a "known recoverable coal resource area" (KRCRA) at Camp Swift. A KRCRA is an area which meets minimum standards for recoverable coal deposits according to accepted mining practices. No federal land can be approved for leasing unless it is included in a KRCRA. Determination of the KRCRA for Camp Swift is scheduled for completion and publication by the USGS in January 1981. In the meantime, preliminary exploration data provided to BLM by LCRA indicate sufficient lignite reserves at Camp Swift to justify evaluation of leasing in this DEIS.
2. USGS must determine the economic value of the coal resource (CREV). Both comparable sales and discounted cash flow analysis will be utilized in deter-

mining minimal acceptable bids and guaranteeing the federal government fair market value. The public will be requested to submit specific comments on mine method, price of the coal resource, maximum economic recovery and other considerations. These comments will be considered in the evaluation. Environmental considerations together with these factors may influence portions of the tract that may be leased.

3. Clear and undisputable record of transfer of titles to DOA for both the surface and mineral estates must be documented. Both titles of transfer and the lease applications were based on cadastral surveys of the area which are believed to contain minor inaccuracies. To aid in resolving this problem, LCRA has recently submitted to BLM results of complete planimetric and photogrammetric surveys of the lease application area from aerial stereophotographs and ground control. The survey was made by an independent contractor and will be fully certifiable for BLM's needs. The DOI Office of the Field Solicitor is reviewing the survey results and the titles of transfer which conveyed Camp Swift to DOA in order to establish the exact extent of federal interest in the surface and mineral estates and to identify any encumbrances to DOA's ownership. The Field Solicitor's review will be completed by Fall, 1980.
4. In consultation with DOA, BLM must complete the Federal Lands Review to determine any areas of the potential lease tract which may be unsuitable for surface coal mining (as defined in 43 CFR 3460). A draft unsuitability assessment is included in Appendix I. As indicated above, this assessment has identified some portions of the original application area which may be unsuitable. These areas have been excluded from the lease tract analyzed in the proposed action. Further discussion of the Federal Lands Review and the areas excluded from the proposed action may be found in the Land Use Planning section of this chapter. The final unsuitability assessment is scheduled for completion by April 1981, prior to a decision on the proposed leasing action.

At the present time, BLM does not expect completion of the above actions to significantly alter the proposed action or alternatives analyzed in this DEIS.

#### **Mitigating Measures**

BLM has considered the practicable means to avoid or minimize environmental harm resulting from the proposed action, above and beyond those standards which are already required by existing regulations or laws. These measures will be incorporated as special stipulations to the lease in cases considered appropriate. These measures are considered to be real, committed, and legally enforceable by federal agencies with jurisdiction over Camp Swift and/or various aspects of the

proposed resource extraction. Standard lease stipulations that are part of all federal coal leases will also apply and are appended to this report for reference (see Appendix 2).

The proposed leasing action has been discussed extensively with the DOA and their lessee, the Texas Army National Guard (TANG). The DOA concurs that leasing for surface mining of lignite resources is feasible provided that stipulations to the lease protect the TANG's needs for continued use of Camp Swift. These conditions are included as a part of the proposed action and as mitigating measures to minimize the potential constraints on TANG's activities. The specific stipulations to the lease set by the DOA and BLM are:

1. Any facilities or improvements which will be destroyed by the mining operation must be replaced to the satisfaction of the Adjutant General, Texas, without cost to the State or Federal Government, prior to destruction of existing facilities.
2. Interference with the use of Camp Swift for military purposes (particularly National Guard training) will be held to a minimum.
3. Mining will be done in an orderly manner and the mined areas restored promptly to the satisfaction of the Department of Army without cost to the State or Federal Government. Upon completion of restoration, the land will again become available for military purposes.
4. The scheduling and sequence of areas to be mined will be submitted to and approved by the Authorized Officer<sup>1</sup> prior to commencement of any action.
5. The area occupied by mining activities at any given time will be held to a minimum. In no event will activities involving the digging and extraction of lignite exceed approximately 120 hectares (300 acres), and approximately 60 hectares (150 acres) for mine ancillary and support facilities (not including water retention areas), and approximately 325 hectares (800 acres) in the process of restoration and reclamation of previously disturbed areas.
6. The Department of the Army and the Texas National Guard will be relieved of all liability for injury or damage which may occur as a result of unexploded ordnance or other dangerous materials within the leased area.
7. The lease holder will comply with safety directives established by the Texas Army National Guard for Camp Swift Military Reservation. Violations of safety directives will result in the lease holder ceasing all operations until the mining operation is in compliance with the safety directives.
8. In order to minimize visual impacts of surface mining, trees and understorey must be left undisturbed in the required 100 foot buffer zone along State Highway 95.

<sup>1</sup>Adjutant General, Texas, or his designate.

9. Before the approval of a mining plan, the lessee will be required to provide (1) supplementary surveys of any historical, cultural, and archaeological values on the lease tract and (2) a comprehensive cultural resource management plan to recover any historical, cultural, or archaeological values identified in the survey. A qualified professional archaeologist and a qualified professional ethnohistorian, approved by the Authorized Officer of the Bureau of Land Management<sup>2</sup>, shall conduct the survey and prepare the management plan. The management plan should integrate prehistoric and historic resources such that they can be utilized to produce a human history of the area. The approval of the mining plan will be conditioned on the approval of both the survey report and the management plan by the Authorized Officer of the Bureau of Land Management and the Texas State Historic Preservation Officer. The cost of the survey and mitigation measures to protect such values identified in the survey shall be borne by the lessee. Items and features of historical, cultural, or archaeological value shall remain under the jurisdiction of the United States.
10. "The Old Fort" site, located on the northwest bank of McLaughlin Creek near its confluence with an eastern tributary, shall be located, if possible, by coordinating field searching with detailed mapping from documentary evidence. If a prior search does not locate the fort, ground clearing in the area shall be monitored by a professional archaeologist for the occurrence of subsurface remains.
11. Efforts shall be made to associate family names with specific, recorded historic sites within the McLaughlin Grant in general, and on the Westbrook Ranch in particular. A partition map of McLaughlin's estate, presently in the Bastrop County probate records, can be used to properly identify historic sites in that Grant. A number of individuals living in Elgin are familiar with the Westbrook property and could identify families associated with historic sites in that locale. Sites included within this category are 41BP142, 41BP150, 41BP151, 41BP153, 41BP157, 41BP183 and 41BP184.
12. Two sites, 41BP150 and 41BP151, included artifacts which apparently date from the pre-Civil War period. Both sites shall be tested to determine the integrity of subsurface architectural features. Measurements of features such as footings, chimneys, etc., shall be made. Effort shall be made to assign specific dates to these two sites using artifactual analysis and research.
13. Architectural features at sites 41BP158, the Beck Housesite, and 41BP159, the Eschberger Housesite, shall be excavated and recorded. These are two of the oldest and least disturbed nineteenth century historic sites in the Dogwood Branch drainage.
14. The Abner Scott cabin site, 41BP134, shall be excavated prior to surface disturbance. Tracts G-315 and G-316 are thought to be have been improved in the early 1850s. Field surveys in 1979 failed to locate improvements such as house footings, wells or other historic features. A professional archaeologist shall be present to monitor the area for the occurrence of subsurface remains.
15. Best Available Control Technology (BACT) will be required. In addition to BACT, more stringent control measures may be imposed. In order to mitigate the potential violations of the annual and 24-hour secondary NAAQS and PSD increments, it may be necessary to restrict mining activities to areas within certain distances from the site boundaries. More detailed analyses must be done by the lessee to define this "buffer zone" with precision. The lessee must, for mining and related activities, demonstrate compliance with applicable federal and state air quality regulations prior to approval of a site-specific mining and reclamation plan.

In addition to the stipulations identified above, any lessee will be required to develop the lease in compliance with all applicable federal, state, and local laws and regulations. These are considered to be in-place constraints to the lessee's activities. Therefore, enforceable statutes, performance standards, and other license requirements are considered part of the proposed action.

Additional mitigating measures, if warranted, may be identified as a result of this EIS process.

### Operational Models

Complete data from site investigations of the lease area are not presently available at this pre-lease stage. To provide an adequate basis for an assessment of the activities resulting from the leasing action, operational models representing four phases of the lease development are described in the following sections. The phases are:

1. Relocation of the TANG facilities to other sites on the Camp Swift Reservation outside the proposed lease area.
2. Extraction of the lignite resource from approximately 1620 hectares (4,000 acres) within the lease area by surface mining methods.
3. Reclamation of the mined or otherwise disturbed areas in compliance with applicable regulations of the Office of Surface Mining Reclamation and Enforcement.
4. Transportation of the extracted resource to the end use site by one of three alternative methods: truck haulage, conveyor, or rail haulage.

The models were devised to facilitate a thorough assessment of the proposed action and alternatives and

<sup>2</sup>State Director, New Mexico, or his designate.



to identify areas where data are not available. These data will be required for any subsequent assessments. The models are not absolute descriptions of the applicants' or other bidders' activities or constraints on the lease development. A detailed environmental analysis will be made of a specific mine plan submitted to OSM by the successful bidder should the lease be issued.

Certain data from LCRA have been used in making the hypothetical development model. In the absence of complete data regarding certain facets of the resource and project requirements, it has been necessary to make limited assumptions. When assumptions have been required, they have been simplified using averages, ranges of current practices, or best estimates. The assumptions do not bias subsequent findings for or against the project. They are discussed in the description of the models.

#### Texas Army National Guard Relocation Model

Principal facilities of the TANG located on the proposed lease area include the administrative support and maintenance areas, firing range, airborne and helicopter drop zones, bivouac areas, access gates, improved and unimproved dirt roads, two mess halls, three 3.5-by-5.5 meter (12-by-18 feet) concrete slabs, and an airstrip. Bivouac areas are outfitted with latrines and a potable water source.

The TANG has chosen a tentative location for relocating the Reservation headquarters area (see Map 1-2). This site is adjacent to U.S. Highway 290. Gates 7 and 6A provide ready access to the area from the highway. If leasing occurs, these facilities would be relocated in advance of actual construction of mine facilities. Principal buildings, access roads, parking, water supply, and power supply would be constructed during mine planning and development drilling stages of the project.

Relocation of larger DOA operational areas would not occur until completion of a conceptual mine design and layout. Staged relocation and construction could then be planned to comply with DOA lease stipulations. Mine facilities which may be required outside the lease area are sediment containment basins, other surface water control structures, and a rail loop (if used). Sizing and siting of these facilities could be done with consideration of TANG requirements. Furthermore, use of overburden as fill material for roads, airstrip, and other facilities requiring level ground could be optimally planned to reduce area requirements for the overburden stockpile.

Bivouac areas or drop zones located in areas not requiring disturbance until later mining stages would be identified, and staged relocation of these facilities would be planned. To the extent required by the Authorized Officer (Adjutant General, Texas, or his designate), all permanent TANG facilities would be relocated outside the lease and mine disturbance areas in early stages of mine development.

#### Lignite Extraction Model

The operational model for extraction of the lignite resource is recovery by surface mining methods. The operational model for this activity consists of a staged site development within the spatial constraints stipulated by DOA. The initial pit would be opened as a box cut along the strike line of the lignite out-crop and advanced down-dip. Vegetation would be cleared in advance of the pit movement and topsoil would be removed and stockpiled or respread on the reclaimed side of the advancing pit. Overburden stripping would be a dragline operation. Tandem operation of two overburden stripping units would be required in the deeper recovery zones. Lignite strata would be prepared for excavation by high capacity bulldozers and front-end loaders. Lignite would be removed by electric shovel or high capacity (12 to 15 cubic meters) front-end loaders. Certain limitations and constraints to this concept are indicated, although at this time, none appear to necessarily preclude successful development of the lignite prospect.

Table 1-1 is a hypothetical schedule of major planning and construction activities during a thirty-five year mine production schedule. Design and permitting, construction of surface facilities, relocation of the TANG facilities, and training of operational staff would occur during the first 5.5 years. Mine production would occur from year 6.0 through 36.5, or for a 30-year period. The last 1.5 years would be spent dismantling facilities, releveling, and completing surface reclamation. OSM regulations provide that reclaimed areas be protected and remain under bond for at least five years following the last reclamation efforts. Therefore, the last area restored would not be available for use by TANG for approximately six to seven years (approximately 41 to 42 years from initiation of activities resulting from the leasing action). Following mining and reclamation, the entire lease area would revert to land uses controlled by TANG.

Table 1-2 is a list of average or usual rates estimated for various project activities. The frequency of each activity, production rates, temporal distribution, and equipment capacities are summarized in this table. Using these activity rates, spatial requirements for each surface facility (except sedimentation and water retention areas) are assigned, where feasible, within the area limitations stipulated by DOA. These data are summarized in Table 1-3 and are used as reference in impact assessment on each component resource.

The operational model for resource extraction is based on an assumed uniform distribution of an estimated 80 million metric tons (90 million short tons) of recoverable lignite throughout approximately 1,620 hectares (4,000 acres) which would be disturbed by surface mining. Maximum depth for lignite mining is approximately 60 meters (200 feet). Economic aspects of the actual resource distribution are not addressed within the scope of this assessment. These issues are to be addressed by

**TABLE 1-1**  
**ESTIMATED SCHEDULE FOR OPERATIONAL MODEL**  
**OF MINE DEVELOPMENT UNDER PROPOSED ACTION**

| Activity   | Year of Initiation<br>of Activity <sup>a</sup> | Duration<br>(Years) |
|--|--|---------------------|
| Development Drilling and Subsurface Investigations | 0.0  | 1.0                 |
| Mine Planning and Permitting                       | 0.5  | 2.5                 |
| Clearing   | 3.0  | 0.3                 |
| Construction of Surface Facilities                 | 5.5  | 2.5                 |
| Construction of Dragline                           | 5.0  | 1.0                 |
| Mine Construction                                  | 5.5  | 1.5                 |
| Strip Overburden                                   | 5.5  | 31.0                |
| Remove Lignite                                     | 6.0  | 30.5                |
| Dismantle Surface Facilities                       | 36.5   | 1.0                 |
| Level and Reclaim Final Surfaces                   | 37.5   | 0.5                 |
| Final Bond   | 38.0   | 7.0                 |
| Final Bond Release                                 | 45.0   |                     |

<sup>a</sup>Year 0 is upon issuance of a lease.

**TABLE 1-2**  
**ESTIMATED ACTIVITY RATES OF OPERATIONAL MODEL MINE<sup>a</sup>**

| Activity   | Active Days per Year | Average Rates  |   |                    |                     |
|--|----------------------|--|---|--------------------|---------------------|
|  |                      | U.S.   | Daily Metric                              | U.S.               | Annual Metric       |
| Topsoil Stripping/Clearing (1 Shift)                                 | 100                  | 6.7 ac-ft  | .8 ha-m                                   | 670 ac-ft          | 8 ha-m              |
| Overburden Stripping (3 Shifts)                                      | 350                  | 42 ac-ft   | 5.2 ha-m                                  | 14,700 ac-ft       | 1,815 ha-m          |
| Lignite Extraction (2 Shifts)  | 250                  | 12,000 tons  | 10,900 metric tons                        | 3.0 mil short tons | 2.7 mil metric tons |
| Pit Advance  | 350                  | 0.4 ac   | 0.16 ha                                   | 140 ac             | 57 ha               |
| Spoil Leveling   | 250                  | 0.5 ac   | 0.2 ha                                    | 125 ac             | 51 ha               |
| Surface Preparation  | 50                   | 2.7 ac   | 1.1 ha                                    | 135 ac             | 55 ha               |
| Topsoil Spreading <sup>b</sup>                                       | 100                  | 1.3 ac   | 0.5 ha                                    | 130 ac             | 53 ha               |
| Soil Amendment Application & Inc.                                    | 10                   | 30.0 ac  | 12.1 ha                                   | 300 ac             | 121 ha              |
| Seeding  | 3                    | 44.0 ac  | 17.8 ha                                   | 132 ac             | 53 ha               |
| Sprigging Coastal Bermuda  | 3                    | 44.0 ac  | 17.8 ha                                   | 132 ac             | 53 ha               |
| <b>Transportation Models</b>   |                      |  |   |                    |                     |
| Rail Haulage (133 car unit trains)                                   | 250                  |  |   |                    |                     |
| Delivery<br>(Loadout to Hopper cars)                                 |                      | 12,000 short tons<br>(2,000 sht.tons/hr)                 | 10,900 metric tons<br>(1,814 met.tons/hr) | 3 mil short tons   | 2.7 mil metric tons |
| Truck Haulage  | 250                  |  |   |                    |                     |
| 15 91-metric ton (100 short ton)<br>Haulers (working 2 shifts)       |                      | 12,000 short tons<br>(12 units-2 shifts)                 | 10,900 metric tons<br>(12 units-2 shifts) | 3 mil short tons   | 2.7 mil metric tons |
| Conveyor<br>(2 shifts)   | 250                  | 12,000 short tons<br>(capacity - 1,000<br>short tons/hr) | 10,900 metric tons<br>907                 | 3 mil short tons   | 2.7 mil metric tons |
| Dewatering (preceeds pit advance at<br>depth >341 meters (100 feet)) | 365                  | 34 mil gallons   | 155 mil liters                            | 12,410 mil gallons | 56,403 mil litres   |

<sup>a</sup>Assumes uniform distribution of resource - 82 million metric tons per 1620 hectares (90 million short tons per 4,000 acres) and uniform average production rate for 30 years; maximum recovery depth of 61 meters (200 feet); mean recovery depth of 34 meters (110 feet).

<sup>b</sup>After initial stockpiling.

**TABLE 1-3  
REQUIRED AND STIPULATED AREAS  
FOR OPERATIONAL MODEL OF MINING FACILITIES**

| Model Component  | Area <sup>a</sup> |                   | Maximum Area <sup>b</sup> |         |
|--|-------------------|-------------------|---------------------------|---------|
|  | Hectares          | (Acres)           | Hectares                  | (Acres) |
| Active Mine Area   |                   |                   | 121                       | (300)   |
| Cleared & Topsoil Stripped                                     | 30                | (75)              |                           |         |
| Open Pit   | 13                | (32)              |                           |         |
| Unleveled Spoils   | 20                | (48)              |                           |         |
| Under Reclamation  | 60                | (145)             |                           |         |
| Reclaimed Areas Under Bond<br>(Minimum Five Years' Protection) | >320              | (>800)            | 323                       | (800)   |
| Surface Facilities   |                   |                   | 61                        | (150)   |
| Topsoil Stockpile  | 8                 | (20)              |                           |         |
| Rail Option  | 17                | (41) <sup>c</sup> |                           |         |
| Overburden Stockpile   | 70                | (170)             |                           |         |
| Offices, Warehouses, Shops, Parking                            | 6                 | (15)              |                           |         |
| Powerline Corridor   | 7                 | (18)              |                           |         |
| Substations  | 1                 | (2)               |                           |         |
| Transportation Corridor<br>(3 Alternative Models)              |                   |                   |                           |         |
| Rail Model   |                   |                   |                           |         |
| Loop   | 200               | (488)             |                           |         |
| Load Out   | 0.5               | (1)               |                           |         |
| Stockpile  | 1.6               | (4)               |                           |         |
| Spur to MKT Line   | 1.6               | (4)               |                           |         |
| Conveyor to Loadout  | 10                | (24)              |                           |         |
| Conveyor Model   |                   |                   |                           |         |
| On Camp Swift  | 15                | (36)              |                           |         |
| Offsite (16 km or 10 miles)                                    | 50                | (120)             |                           |         |
| Truck Haulage Model  |                   |                   |                           |         |
| On Camp Swift  | 22                | (54)              |                           |         |
| Offsite (16 km or 10 miles)                                    | 50                | (120)             |                           |         |
| Sedimentation Ponds  |                   |                   |                           |         |
| McLaughlin Creek   | Not Projected     |                   | Not Restricted            |         |
| Unnamed Creek  |                   |                   |                           |         |

<sup>a</sup>Estimated; Based on activity rates from Table 1-2

<sup>b</sup>DOA Stipulations

<sup>c</sup>Rail Transport Model

USGS in determination of the KRCRA and CREV. Data on recoverable reserves, mining area, and the maximum recovery depth are provided by the applicant (LCRA).

Mining would begin with clearing of the surface and stripping topsoil for placement in the topsoil stockpile. Initial excavation of the overburden would begin during the equipment break-in and operator training periods. Overburden would be stripped and placed in the overburden stockpile. Once an operating size pit is excavated, topsoil and overburden would be returned to the opposite side of the pit and leveled for reclamation. Materials stockpiled would not be removed until the final reclamation stages for the initial operating pit. If lignite is recovered from depths as great as 60 meters (200 feet), DOA stipulations for limited surface disturbance may prove to be a severe constraint for this type of operation due to requirements for overburden stockpile and pit size. Alternatively, overburden materials could also be utilized in construction of embankments, haul ramps, and other facilities requiring a level grade or fill material.

Recovery of lignite from a depth of approximately 60 meters (200 feet) by dragline is constrained by safety considerations, operating pit dimensions and limitation of distances to which spoil may be cast. Operation of a dragline from the top of an advancing 60 meter highwall can be hazardous, and depends on the integrity of the advancing slope. Therefore, a benched operation utilizing at least two excavating units would be required. Groundwater seepage into the pit from the excavated face further reduces stability of the slope. At depths greater than 30 meters (100 feet) dewatering ahead of the highwall advance would probably be necessary.

Because of safety considerations and the limited reach of a dragline for casting spoil, a tandem operation (i.e., two overburden stripping units) would be required for deeper recovery zones (e.g., 40 meters or 125 feet). A second dragline or other excavating unit, operating from a benched position on the advancing highwall, can improve the effective recovery depth by stripping below the reach of the surface unit and/or double handling the spoil material. Physical constraints for this type operation are in keeping the working pit area wide enough to accommodate in-pit operations (e.g., preparation of the lignite surface, excavation of the lignite, and loading lignite to haulage units or a hopper-conveyor).

The mine operation work force would consist of approximately 230 individuals. A work force breakdown by employee categories is given in Table 1-4. Construction activities would require approximately the same number of persons. It is often a common practice of utility companies in Texas to heavily utilize the same persons for permanent employment.

## Reclamation Model

The model for reclamation is in compliance with requirements of the Surface Mining Control and Reclamation Act of 1978 (SMCRA) and the regulations and performance standards of the Office of Surface Mining Reclamation and Enforcement (OSM).

Topsoil would be stripped from all construction surfaces to a depth of approximately 0.2 to 0.5 meters (0.5 to 1.5 feet), stockpiled, and protected until needed for reclamation of surfaces. Topsoil from the mining area would be stripped to a depth of approximately 0.2 to 0.5 meters (0.5 to 1.5 feet) and initially placed in the topsoil stockpile. When the expanding pit reaches an operating size, topsoil would be stripped in advance and returned to the reclaimed spoil surfaces.

Reclamation begins with leveling of the spoil banks on the back face of the advancing pit. Leveling would not proceed at a rate which would cause caving of spoils into the pit. Therefore, the unleveled zone on the rear face of the pit would consist of spoils heaped above the surface to a height determined, in part, by the reach of the dragline.

As spoils are leveled, the surface would be broken up by disking and prepared for redistribution of soil material as it is removed in advance of the pit. Topsoil would be spread and mulched (if not already mixed) with chipped or shredded plant debris salvaged during clearing operations. Nitrogen and other fertilizers would be applied at appropriate rates to be determined by soil analyses. Fertilizer and any other soil amendments would be incorporated in the plow horizon by disking.

Initial plant cover would be attained at different times of the year by appropriate schedules and seed mixtures. An annual clover or other legume (with proper inoculum) and/or annual grasses would be seeded. Selection of plant species or varieties would depend on properties of redistributed soil. During the following spring, coastal bermuda would be sprigged into the plant stubble and fertilized as required.

After plant cover is established, one of two reclamation concepts may be chosen: (1) the improved pasture may be maintained, or (2) nursery stock or seed of native species suitable for wildlife food and cover may be planted (e.g., oaks, yaupon, sumac, sunflower, etc.). If the improved pasture approach is followed, it would be abandoned from pasture management practices upon release from reclamation bond and permitted to revert to natural successional processes. Plants having wind-dispersed seed would be the earliest invaders, followed by bird dispersed species. Either reclamation/ revegetation model would provide suitable stabilization of surfaces to control soil erosion and to accommodate use by the TANG. The differences in species composition would only affect potential use by endemic

**TABLE 1-4  
PROJECTED EMPLOYMENT LEVELS  
FOR OPERATIONAL MODEL  
OF MINE DEVELOPMENT**

| Category                   | Permanent<br>Employees |
|----------------------------|------------------------|
| Management/Engineering     | 6                      |
| Supervisory                | 34                     |
| Dragline Operator          | 8                      |
| Dragline Oiler             | 8                      |
| Dragline Groundcrew        | 6                      |
| Shovel Operator            | 2                      |
| Shovel Oiler               | 2                      |
| Dozer Operator             | 6                      |
| Coal Truck Driver          | 28                     |
| Water Truck Driver         | 2                      |
| Utility Equipment Operator | 26                     |
| Mechanic                   | 10                     |
| Mechanic's Helper          | 10                     |
| Electrician                | 6                      |
| Electrician's Helper       | 12                     |
| Welder                     | 6                      |
| Welder's Helper            | 6                      |
| Machinist                  | 6                      |
| Maintenance Crew           | 16                     |
| General Laborer            | 16                     |
| Secretary                  | 4                      |
| Administrative Support     | 8                      |
| Technician                 | <u>2</u>               |
| <b>Total</b>               | <b>230</b>             |

wildlife populations, in that certain desirable forage species would reinvade more slowly than most wind-dispersed species.

The OSM regulations require that reclaimed areas must be protected for a period of at least five years after the last active efforts to reclaim. Therefore, reclaimed areas would not be made available to TANG until release from reclamation bond. This requirement may constrain the lessee mine plan because the DOA stipulates that no more than about 320 hectares (800 acres) (i.e., an average of six years' mined surface under this operational model) may be held in reclamation at any one time.

#### Transportation Models

Three models for transportation of the lignite to the end-use site are assessed. These are:

1. Truck haulage for a distance of approximately 16 kilometers (10 miles) to the end-use site;
2. Conveyor transport for a distance of approximately 40 kilometers (25 miles);
3. Unit train transport for a distance of approximately 40 kilometers (25 miles) or greater.

The lignite would be used to produce electricity for sale to the public. The method of transportation would be determined by the distance the lignite must be transported to a power plant. For example, if LCRA is the successful bidder in the proposed lease sale, the lignite would be burned at one of their existing generating plants--Fayette Station (fueled by coal) in Fayette County or Gideon Station (fueled by natural gas) on Lake Bastrop in Bastrop County. Both plants are likely to be expanded for lignite fuel. Haulage to the Gideon Station would be feasible by truck or conveyor. Rail haulage would be the most economic means of transport to the Fayette Station or to Austin, San Antonio, or other cities outside Bastrop County.

#### Truck Haulage

Truck haulage is the most flexible operation for accommodating difficult in-pit maneuvering. A fleet of fifteen, 91-metric ton (100 short ton) capacity haulers with 85 percent availability (12 units) operating two shifts per day could deliver the estimated mine production in 250 days per year. Haulers of this capacity could easily be loaded by a 12 cubic meter electric shovel with a five-minute cycle time. With an estimated 1.5 hours round-trip travel time, this size shovel would not have to operate at capacity. Production could also be increased by adding haul units or a third shift. Factors which need to be determined to assess feasibility of truck haulage include: (1) load-bearing capacity of the pit floor, (2) effective grades into the pit, and (3) reliability of a diesel fuel source.

#### Conveyor Transportation Model

The corridor for this system would consist of a 30-meter (100-foot) right-of-way to accommodate the overland belt conveyor, a service-access road, and power lines to auxiliary drive units. Space requirements and inflexibility of the conveyor system could cause difficulty if frequent relocation of the feed-hopper is required. This system is most compatible with continuous excavators in a larger pit. No on-site stockpile for lignite would be required. A 12-cubic meter electric shovel could readily load the conveyor and provide delivery of the estimated mine production by operating on two shifts for 250 days per year.

#### Rail Transportation Model

If the lease is offered for sale and subsequently acquired by LCRA, the existing Missouri, Kansas and Texas (MKT) rail corridor to the Fayette Station site is ideally located for rail haulage (Map 1-1).

Transportation by unit train would require the following facilities:

1. Belt conveyor-lift out of pit to deliver coal to an on-site stockpile.
2. On-site, stacker-reclaimer and stockpile (or storage silo).
3. Load-out station with hopper fed from lignite stockpile or silo.
4. Rail loop to accommodate unit train of approximately 133 top-loading, gondola-type cars.
5. Approximately 133 top-loading, rotary dump cars with a 91-metric ton (100-short ton) capacity and five diesel-electric locomotive units.
6. Rail spur connection to the main line going to the final end-use site.

In a rail transportation system, lignite is fed from the pit via conveyor to a stacker-reclaimer or storage silo. From the storage yard, lignite is fed to the unit-car loadout facility. If unit trains run daily, a minimum of 101 (90 percent availability, 90 percent loaded) 91-metric ton (100-short ton) rail cars would be required. If unit trains run 250 days per year, 148 cars, 90 percent available and 90 percent loaded (133 cars), would be required to move the estimated mine production capacity of 10,900 metric tons (12,000 short tons) per day. The rail loop would require approximately 200 hectares (500 acres) to accommodate a unit train of 133 cars and its locomotives. DOA stipulations would make it necessary to construct this facility offsite.

## THE LARGER AREA ALTERNATIVE

### Description

The larger area lease alternative is to offer for sale through competitive bidding approximately 2,710 hectares (6,700 acres) of federally-owned lignite reserves underlying the Camp Swift Military Reservation in Bastrop County, Texas. The larger area lease alternative includes approximately 40 hectares (100 acres) in addition to the lands offered for lease in the proposed action (see Map 1-2). These additional lands are excluded from the proposed action because of their potential unsuitability for surface mining, which is based on the criteria specified in BLM coal leasing and management regulations (43 CFR 3461). However, BLM has not made a final determination that these lands are unsuitable; therefore, the larger alternative has been included for purposes of impact assessment.

Lands excluded under the proposed action which would be included under the larger area alternative are:

1. 34 hectares (85 acres) south of F.M. Road 2336, of which 23 hectares (56 acres) are presently leased to the University of Texas System for use as a Cancer Research Center (Veterinary Unit).
2. Three small cemeteries and 30-meters (100-foot) buffer zones, comprising approximately two hectares (four acres).
3. The segment of Texas F.M. Road 2336 right-of-way and 30-meter (100-foot) buffer zone totalling six hectares (15 acres).
4. Unspecified acreage for which the DOA or BLM responsibilities are subject to adjudication, but which may be resolved prior to a decision on offering the lease for sale.

Before the larger area alternative is possible, the following issues would have to be resolved:

1. The University of Texas System would have to concur with the action by releasing the DOA from terms of its lease for the 23 hectare (56 acre) tract. Such concurrence might require a lessee to provide an alternate tract for the duration of mining.
2. The Texas Department of Highways and Public Transportation would have to consent to relocation of its right-of-way for F.M. Road 2336.
3. The DOA must take action to have the cemeteries relocated, under provision of Texas law, before lease issuance.
4. Upon completion of the Field Solicitor's review of the Titles of Transfer, any surface and mineral estates of questionable ownership must be adjudicated.

## Mitigating Measures

The larger area lease alternative carries the same lease stipulations as the proposed action. The conditions for determining the larger area inclusions to be excepted from BLM's unsuitability criteria must also be met. These conditions may need to be included as lease stipulations.

The following stipulations could be appended to the lease as mitigating measures accompanying the larger area alternative:

1. The lessee shall provide the University of Texas System, Cancer Research Center (UT) an alternative area of comparable size, proximity, and utility as the 23 hectare (56 acre) tract presently leased by UT from DOA. At no cost to UT, the lessee shall relocate any structures or facilities presently on the tract used by UT.
2. The alternative route for F.M. Road 2336 should be acceptable to the State Department of Highways and Public Transportation and Bastrop County following the public hearing process. The relocated highway would have to be built to current design standards and at the expense of the lessee. The lessee would be responsible for performing all work subject to state approval. This would involve the acquisition and clearing of right-of-way, relocation of displaced, preparation of plans and specifications and award of construction contract. Because of Texas law, no disruption of traffic would occur in relocation of F.M. Road 2336.

### Operational Models for Larger Area Alternative

The operational models for relocation of the TANG facilities, extraction of the resource, land reclamation, and lignite transportation would be the same as those for the proposed action. The difference would be the mining and reclamation of another approximately 40 hectares (100 acres). Approximately 2.4 million metric tons (2.7 million short tons) of lignite would be recovered over and above the tonnage in the proposed action alternative. UT's use of their grazing lease would be directly disrupted for up to 8 years. Mining of the 34 hectare (85 acre) tract containing the Ut lease would also increase noise levels. at the UT Cancer Center. Other impacts of this alternative would be proportionately the same as those from the proposed action.

### NO ACTION ALTERNATIVE

The BLM is required to act on the application for hard-ship leasing of federally-owned coal under the provisions of 43 CFR 3425. The application of LCRA is referenced in the regulations as qualifying for leasing under these provisions. Therefore, the "no action" alternative is to reject the LCRA application.



An application may be rejected if the Secretary of the Interior determines that: (1)the application is not consistent with the applicable regulations, (2)issuance of the lease would violate the integrity of the normal leasing process, or (3)leasing of the lands covered by the application would be contrary to the public interest for environmental or other sufficient reasons. Under provision of the same regulations, any application subject to rejection because of the above reasons shall not be rejected until the applicant is given notice in writing of the opportunity to provide additional information relevant to making the three determinations cited above.

## ALTERNATIVES NOT ANALYZED IN THE EIS

No other reasonable alternatives, including any outside the jurisdiction of DOA and BLM, have been identified which differ significantly from the proposed action or larger area alternative and which still satisfy the same purpose and need.

## REGULATORY AND PLANNING CONTROLS

### Regulatory Controls

The proposed leasing action and its assessment by this investigation are under the authority of:

1. The Mineral Leasing Act of 25 February 1920, as amended (30 U.S.C. 181 *et seq.*)
2. The Mineral Leasing Act for Acquired Lands of 7 August 1947, as amended (30 U.S.C. 351-359 *et seq.*)
3. The Federal Land Policy and Management Act of 1976, 21 October 1976 (43 U.S.C. 1701 *et seq.*)
4. The Surface Mining Control and Reclamation Act of 1977, 3 August 1977 (30 U.S.C. 1201 *et seq.*)
5. The Multiple Mineral Development Act of 13 August 1954 (30 U.S.C. 521-531 *et seq.*)
6. The Department of Energy Organization Act of 4 August 1977 (42 U.S.C. 7101 *et seq.*)
7. The National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*)
8. The Federal Coal Leasing Amendments Act of 1976, as amended (90 Stat. 1083-1902)
9. The Act of 30 October 1978 (92 Stat. 2073-2075) (authorizing Secretary of Interior to exchange coal leases).
10. The National Environmental Policy Act of 1970, as amended (42 U.S.C. 4371 *et seq.*)

### Authorizing Actions

The authorizing actions which would be applicable to the proposed Camp Swift leasing and mining, should the lease be offered for sale, are summarized in Table 1-5.

## Further Environmental Assessment Points

If the Camp Swift lignite reserves are leased, the lessee will have three years in which to submit a site-specific mining and reclamation plan to OSM. Environmental analysis of the plan will be required before it can be approved.

In addition, if the lessee decides to expand an existing power plant or construct a new plant, the Environmental Protection Agency will require a new-source NPDES permit. Issuance of such a permit would require environmental assessment.

## RELATIONSHIP TO LAND USE PLANNING

The Federal Coal Leasing Amendments Act of 1976 requires federal coal lease sales to be compatible with federal land use planning. However, where the coal resources are insufficient to justify preparation of a comprehensive federal land use plan, the coal may be leased if the lands are included in a state land use plan. The state plan may be supplemented by additional land use analysis, if needed, to meet overall federal land use planning requirements.

### Texas Land Use Plan

The State of Texas prepared a "Plan for the Multiple Land-Use of Camp Swift, Bastrop County, Texas" (Wermund 1977). After consideration of existing and potential resource values and land uses, the Texas plan recommended leasing the Camp Swift lignite deposits to an electrical power producer in accord with the Federal coal Leasing Amendments Act and with the following additional recommendations:

1. Texas National Guard can continue military training in the unmined and reclaimed areas as mining proceeds.
2. The subsurface lease holder will surface-mine lignite in a cooperative manner reasonably adjusted to the programs of the present surface lease holder.
3. The miner will restore and reclaim the surface after mining to return the land to nearly its present contours for the passage of through-going streams and revegetate the surface with trees, shrubs, and grasses in a ratio which approaches the present ratio of land resources.
4. The surface lease-holder and the strip-miner shall cooperatively implement a schedule of mining and reclamation, area by area, which is satisfactory to both parties.

No other Texas state or local land use plans are known to apply to the proposed Camp Swift leasing action.

**TABLE 1-5  
AUTHORIZING ACTIONS APPLICABLE TO  
PROPOSED CAMP SWIFT LEASING AND MINING**

| Agency   | Responsibility   |
|--|--|
| <b>Federal Agencies</b>                                  |  |
| Department of the Interior                               |  |
| Secretary of the Interior                                | Approve and authorize competitive lease sale   |
|  | Approve cooperative agreements with state to establish authority of state regulatory agencies over surface mining operations |
| Assistant Secretary for Energy & Minerals                | Approve mining and reclamation permits   |
| Bureau of Land Management                                | Conduct Federal Lands Review (unsuitability assessment)  |
|  | Determine lease stipulations, fair market value  |
|  | Issue lease  |
|  | Review and concur with mining permit applications and recommend mitigation to OSM  |
| Geological Survey  | Designate known recoverable coal resource area   |
|  | Determine maximum economic recovery, coal resource economic value  |
|  | Review and concur with mining and exploration plans  |
|  | Supervise production and coal resource recovery  |
| Fish and Wildlife Survey                                 | Fish and wildlife consultation   |
| Office of Surface Mining                                 | Approve mining and reclamation permit applications   |
|  | Approve exploration permit applications (post-leasing)   |
|  | Assure compliance with lease terms and permit requirements   |
|  | Accept and release performance bonds   |
|  | Negotiate state cooperative agreements for Secretarial approval  |
| Department of the Army                                   |  |
| Office of the Assistant Secretary                        | Provide surface owner consent  |
|  | Determine lease stipulations   |
|  | Determine post-mining land use   |
| Adjutant General of Texas<br>(Texas Army National Guard) | Approve schedule, duration, and extent of surface disturbance  |
| Corps of Engineers                                       | Issue permits for actions involving:   |
|  | Discharge of dredged or fill material  |
|  | Construction on navigable waterway   |
| Advisory Council on Historic Preservation                | Review of actions affecting properties eligible for the National Register of Historic Places                                 |
|  | Concurrence with recommendations of eligibility and mitigation plans   |
| Environmental Protection Agency                          | New source determination   |
|  | NPDES review   |
|  | PSD review and NAAQS protection  |
|  | Protection of underground drinking water supplies  |

**TABLE 1-5**  
**AUTHORIZING ACTIONS APPLICABLE TO**  
**PROPOSED CAMP SWIFT LEASING AND MINING**  
**(continued)**

| Agency                                    | Responsibility   |
|---|--|
| Department of Energy                      | Review and approval of lease terms   |
| Department of Justice                     | Review coal holdings of successful bidder for anti-trust considerations  |
| Department of Labor                       |  |
| Mining, Safety and Health Administration  | Enforce regulations protecting health and safety of mines  |
| <u>State Agencies (Texas)</u>             |  |
| Dept. of Highways & Public Transportation | Public road crossings, intersections, overpasses and underpasses   |
| Department of Water Resources             | NPDES review<br>Wells for withdrawal or injection<br>Surface water diversion and impoundment<br>Industrial solid waste disposal                                  |
| Texas Air Control Board                   | Construction and operating permits<br>Emission control systems and practices   |
| Texas Historical Commission               | Historical landmarks and antiquities protection; review and recommendation of sites for National Register; concurrence with mitigation                           |
| Department of Health Resources            | Sanitary facilities during construction<br>Water supply approval   |
| Railroad Commission of Texas              | If a Texas-Department of Interior Cooperative Agreement is approved: mining and reclamation plan approval, compliance with lease terms and permit requirements * |
| <u>Local Agencies</u>                     |  |
| Bastrop County Commissioners' Court       | Sanitation permit for septic facility  |

\*The Office of Surface Mining and the Railroad Commission of Texas are presently negotiating a State of Texas-Department of the Interior Cooperative Agreement. If and when that agreement is approved by the Secretary of the Interior, the Railroad Commission will be responsible for administering and enforcing federal reclamation requirements on Camp Swift.

## Federal Lands Review

The Texas plan was prepared before the DOI Coal Management Regulations (43 CFR 3400) were issued. Consequently, it does not meet the Federal Lands Review requirements of those regulations. Therefore, BLM is conducting this review as part of its environmental analysis of the proposed leasing action.

The Federal Lands Review is the application of twenty unsuitability criteria and exceptions (43 CFR 3461.1) to all areas proposed for leasing. In general, the criteria cover such issues as threatened or endangered plant and animal species, historic or archaeological sites which may be eligible for the National Register of Historic Places, 100-year floodplains, existing leases or rights-of-way, etc. The purpose of the Federal Lands Review is to identify those areas where conflicting land uses (as defined by the unsuitability criteria) would restrict or prohibit leasing or surface mining of the coal reserves. During the review, if one or more of the unsuitability criteria are found to apply to an area and no exception to the criterion is applicable, then the area must be considered unsuitable for surface coal mining operations and excluded from the proposed lease tract. In some cases (e.g., wildlife criteria, National Register criterion), an exception may allow leasing but limit or prohibit mining or other surface-disturbing activities in order to protect a particular resource. A summary of conclusions from the unsuitability analysis is given in Table 1-6.

BLM has prepared a draft unsuitability assessment on Camp Swift (see Appendix 1, which also includes the unsuitability criteria). The draft assessment was prepared in coordination with DOA (as the surface management agency) and with other federal or state agencies as required by specific criteria.

The draft assessment concludes that approximately 60 hectares (140 acres) of the potential lease area may be unsuitable for leasing. These include:

1. Texas Utilities Fuel Company right-of-way for a buried natural gas pipeline (0.2 hectares; 0.5 acre)
2. Three small cemeteries, including 30-meter (100-foot) buffer zones (1.6 hectares; 4 acres)
3. Right-of-way for F.M. Road 2336, plus 30-meter (100-foot) buffer zone north of the road (6 hectares; 15 acres)
4. A 23 hectare (56 acre) lease to the University of Texas System, Cancer Research Center, plus buffer zones (totaling 34 hectares; 85 acres)
5. A 30-meter (100-foot) buffer zone along Texas State Highway 95 (14 hectares; 35 acres).

All of the above area has been excluded from the proposed leasing action. However, exceptions may apply to F.M. Road 2336 and the U.T. System lease, and BLM is continuing coordination with all parties to determine

whether they will consent to leasing. In addition, DOA may arrange for relocation of the three cemeteries under provision of Texas law before DOI reaches a decision whether to lease. Consequently, the larger area alternative was developed to consider the impacts of leasing approximately 40 additional hectares (100 acres).

A final unsuitability assessment will be prepared and published in conjunction with the final EIS. The final assessment will take into consideration any substantive public comments on the draft EIS and draft assessment, any additional impact analysis provided in the final EIS, and the results of the ongoing consultation and coordination discussed above.

## RELATED ACTIVITIES

Federal and state agencies listed in Chapter Four were consulted for information on any projects, programs, or facilities which they operate or have planned in the Camp Swift area, and which might be affected by the proposed leasing action. The majority of agencies so contacted identified no activity, plan, or program which would conflict with the proposed leasing action.

Several agencies mentioned the need for an acceptable reclamation plan and offered assistance in its preparation. A number of federal agencies deferred comment to their state agency counterparts. Others observed that they would reserve judgment on impacts of the proposed action until they receive a copy of the DEIS. Several of the federal agencies contacted responded that their involvement with the project and the DEIS was in direct coordination with BLM (e.g., the U.S. Department of Energy and the Office of Surface Mining).

The Environmental Protection Agency (EPA) noted that they had recently provided sewer system grants to the City of Elgin and other area communities not as close to Camp Swift. They expect no significant effect on these facilities as a result of mining lignite at Camp Swift.

The Economic Development Administration (EDA) also has funded some public facility improvements (water systems, drainage systems) in the area. None are expected to be directly or adversely impacted by the proposed leasing.

EDA did assist the development of the Environmental Science Park at Buescher State Park in the mid 1970s. It is linked for research purposes with the University of Texas System Cancer Center Veterinary Unit at the south end of Camp Swift (see land use discussions in this DEIS).

Probably the most directly related project in the study area is being conducted by the United States Geological Survey (USGS). USGS is performing a three-year

**TABLE 1-6  
SUMMARY OF UNSUITABILITY ANALYSIS**

| <b>Criterion</b> | <b>Subject</b>  | <b>Consultation</b>  | <b>Status</b>  |   |
|------------------|---|--|--|---|
| 1                | (National Parks, Wildlife Refuges, Wilderness, etc.)                        | None on Camp Swift   | DOA, USGS, Corps of Engineers, et al.  | Criterion not applicable  |
| 2                | (Rights-of-way, easements, leases)  | F.M. 2336 + buffer zone, 15 ac.  | Texas Dept. of Highways and Public Transportation, DOA                           | Consultation continuing, unsuitable at present  |
|                  |   | U.T. Cancer Research Center lease+buffer (85 ac.)<br>TANG lease          | U.T. System, DOA<br><br>TANG, DOA  | Unsuitable at present, consultation continuing<br><br>Exception applies (permission to lease with stipulations to protect use)                            |
|                  |   | Texas Utilities Fuel Co. pipeline ROW, 0.5 ac.<br>LCRA transmission line | LCRA, DOA  | Deleted from proposed lease area<br>Exception applies (agreement to move line if necessary to allow mining)   |
| 3                | (Public roads, institutional buildings, cemeteries)                         | F.M. 2336 + buffer zone, 15 ac.  | Texas Dept. of Highways and Public Transportation, USDI Office of Surface Mining | Consultation continuing, unsuitable at present  |
|                  |   | Buffer zone for state Highway 95, 35 ac.                                 |  | Unsuitable for mining   |
|                  |   | 3 cemeteries + buffer zones, 4 ac.<br><br>TANG buildings + buffer zone   | DOA; heirs<br><br>DOA, TANG  | Unsuitable for mining, DOA consultation with heirs continuing under state law<br>Exception applies (permission to lease with stipulations to protect use) |
| 4                | (Wilderness Study Areas)  | None on Camp Swift   | BLM, Corps of Engineers  | Criterion not applicable  |
| 5                | (Areas of outstanding scenic quality)                                       | None on Camp Swift   | BLM  | Criterion not applicable  |
| 6                | (Areas permitted for scientific studies)                                    | U.T. Cancer Research Center lease+buffer (85 ac.)                        | U.T. System  | Unsuitable at present, consultation continuing  |
| 7                | (Sites of historic or cultural significance)                                | Sites eligible for National Register                                     | Texas Historical Commission, U.S. Advisory Council on Historic Preservation      | Exception applies (sites can be salvaged without significant impact)  |
| 8                | (National Natural Landmarks or Natural Areas)                               | None on Camp Swift   | BLM  | Criterion not applicable  |
| 9                | (Habitat and critical habitat for federal threatened or endangered species) | No habitat on Camp Swift   | USFWS  | Criterion not applicable  |

**TABLE 1-6**  
**SUMMARY OF UNSUITABILITY ANALYSIS**  
**(continued)**

| Criterion  | Subject                            | Consultation   | Status  |
|--|------------------------------------|--|---|
| 10 (Habitat for state threatened or endangered species)                    | No habitat on Camp Swift           | Texas Parks and Wildlife Department  | Criterion not applicable                                      |
| 11 (Bald or golden eagle nest or sites)                                    | None known or likely on Camp Swift | USFWS, TPWD  | Criterion not applicable                                      |
| 12 (Bald or golden eagle roost or concentration areas)                     | None known or likely on Camp Swift | USFWS, TPWD  | Criterion not applicable                                      |
| 13 (Falcon cliff nesting sites)  | No sites on Camp Swift             | USFWS, TPWD  | Criterion not applicable                                      |
| 14 (High priority habitat for migratory birds of high federal interest)    | None on Camp Swift                 | USFWS  | Criterion not applicable                                      |
| 15 (Fish and wildlife habitat for resident species of high state interest) | None on Camp Swift                 | TPWD   | Criterion not applicable                                      |
| 16 (Riverine, coastal and 100-year floodplains)                            | McLaughlin and Dogwood Creeks      | USGS, public participation, Capital Area Planning Council, Governor's Budget and Planning Office | Determination continuing, but so far criterion not applicable |
| 17 (Municipal watersheds)  | None on Camp Swift                 | Corps of Engineers   | Criterion not applicable                                      |
| 18 (National Resource Waters)  | None on Camp Swift                 | Corps of Engineers   | Criterion not applicable                                      |
| 19 (Alluvial valley floors)  | None on Camp Swift                 |  | Criterion not applicable east of 100th meridian               |
| 20 (Lands proposed by the State of Texas)                                  | None                               | Texas Railroad Commission  | Criterion not applicable                                      |

study of water resources at Camp Swift with an emphasis on groundwater that might be affected by mining the lignite. Begun in 1979, USGS anticipates monitoring conditions after mining begins (assuming it does) to compare conditions before and during mining.

Finally, the State Department of Highways and Public Transportation (SDHPT), while noting no major projects in the study area, did respond that any highway relocation associated with the leasing and mining would be at the lessee's expense.

As to the proposed action's relationship to regional development trends, particularly energy developments, considerable activity is evident (see Cumulative Impacts discussion in Chapter Three). Based on existing lignite projects and the amount of lignite resource under lease within 80 kilometers (50 miles) of Camp Swift, a number of trends could interact with its development to contribute to its significance.

The region's lignite resource, existing power plants and planned generating facilities are shown on map 3-3. Wilcox Formation lignite extends in a band from Milam to Caldwell counties while the lower-grade Yegua-Jackson lignites occur in the eastern section of the region located in Fayette County. The Sandow plant at Rockdale in southern Milam County was the first modern surface mine operation in Texas, beginning in 1954. A plant fired by western coal was recently constructed by LCRA in Fayette County with a second unit scheduled to come on line in 1980.

Leasing of the region's lignite resource began in the mid 1950s and became vigorous during the early 1970s. Landowners in Milam County signed lease agreements with Alcoa and Texas Utilities Services, Inc. (an investor-owned utility serving the Dallas-Fort Worth area for lignite to fuel the Sandow Plant). Over 15,380 hectares (38,000 acres) of Bastrop County lignite have been leased to eight different energy companies, including LCRA. LCRA also holds a share in leases on approximately 4,860 hectares (12,000 acres) in Fayette County adjacent to their present coal-fired generating plant. These lease transactions allow the energy companies the option to mine lignite during the term of the lease, which may be as long as 40 to 50 years. The Rockdale site in Milam County is the only area in the region where large-scale surface mining is in operation at the present time. Should BLM approve a leasing action at Camp Swift, the Camp Swift site would likely become one of the next large-scale surface mines to be developed.

## RECOMMENDATIONS

The following measures are recommended for further consideration by the lessee and appropriate federal and state agencies at the time of mining plan development.

In some cases (e.g., hydrology), data are presently insufficient to develop the recommendations into specific mitigation measures. In other cases (e.g., vegetation/wildlife), although analysis indicates that impacts to these components would not be significant, it is felt that additional measures could be taken to reduce impacts even further.

### Paleontology

Providing a professional paleontologist periodic access to fresh exposures of lignite could provide an opportunity to study scientifically interesting fossils.

### Vegetation / Wildlife

The lessee should develop an accurate description of seasonal and resident wildlife species and floristic composition of vegetation to determine more specifically whether mining would cause significant impacts.

At a minimum, the area should not be managed as "pasture" in the long-term but allowed to return to invader species. Preferably the long term revegetation should include reestablishment of native species suitable for native species of wildlife. Such revegetation could be achieved by utilization of nursery stock grown from native seed sources, by fertilization, by mulching, and/or by planting native seeds using a seed drill and non-till farming practices. Restocking with loblolly pine and other invasive woody species would be more readily accomplished than restocking with oaks and certain other prime wildlife food species.

### Soils

Due to the high erosion potential of the disturbed overburden, a well-designed combination of moderate slopes, terracing and drainage, beyond that required by regulations, may be necessary.

Soil erosional effects could be reduced by minimizing the amount of exposed area and by not removing existing vegetation sooner than necessary. Areas graded for dikes, levees and road fills, and diversion channels should also be seeded and/or mulched as soon as feasible.

Reclamation problems inherent to existing soils and overburden material at Camp Swift do not preclude successful reclamation. However, appropriate management practices and soil amendments described in the worst case analysis may be required of the lessee:

1. Collect representative field samples from key soils and analyze them for major physical and chemical parameters.
2. Collect representative overburden and lignite samples from selected continuous cores and analyze them for major physical and chemical properties.

3. Determine and describe revegetation and reforestation procedures and practices including soil amendments, types, and seeding methods.
4. Determine and describe techniques, schedule, equipment and costs for each phase of reclamation operation.
5. Test and compare suitability of mixed overburden and topsoil as a medium of plant growth in the greenhouse and/or on-site test plots.
6. Determine recharge rates, rainfall-runoff relations and soil erosion loss rates for the existing soils.
7. Open test pits and determine recharge rates, rainfall-runoff relations and soil erosion loss rates from various simulated surface slope conditions and compare them with those of the existing soils.
8. Long, convex slopes should be broken by terraces or by providing a rough surface and a more intricate network of minor drainageways and ephemeral channels than is normally used.
9. Seeding with an appropriately inoculated clover or other legume and mulching with chipped plant debris salvaged during clearing operations should be done to encourage the natural reinnoculation of other soil microbes and symbionts essential to re-establishment of climax woody species.

Detailed soil and subsurface investigations should be initiated by the lessee very early in the mine planning stage. Particular attention should be given to selection of the best available topsoil material, erosion potential of proposed soil cover, and adaptability of plant species proposed for use in revegetation.

#### **Hydrology**

In order to assess potential surface water erosion impacts, flow volume from pressure relief wells and pit seepage to be discharged to surface waters should be accurately determined.

The lessee should investigate alternative measures for disposing of the expected large volumes of discharge water, in order to reduce stream bed erosion. Wells should be strategically placed around the mining area to monitor groundwater changes.

#### **Land Use**

To reduce potential dangers from unexploded ordnance, the lessee could conduct a survey of the lease area prior to topsoil stripping, using current technology for metal detection.

#### **Transportation**

To minimize impacts on F.M. 2336, entrances and exits to the lease area should be located only on U.S. Highway 290 and State Highway 95.

Bastrop County or the State Department of Highways and Public Transportation may want to post signs on weaker county roads and bridges prohibiting usage by vehicles above a certain weight.

#### **Socioeconomic**

The short-term population impacts of the project may be mitigated by planning and cooperation between the mine operator and local officials. The mine operators should inform local officials and the present county residents of the specific time table of development and the workforce required to support mining activities.

#### **Noise**

A comprehensive baseline noise survey should be performed to determine the equivalent casting day-night sound level in areas potentially impacted by mining and transportation activities. A detailed analysis of noise source (mining/transportation equipment) description and duty cycle should be conducted and noise impact modeling should be performed to determine more precisely the degree of impact expected upon receptors. If receptors are expected to be exposed to noise levels from mining above 55 dB, then spoil berms should be planned as barriers between mining activity and receptor location when possible.



## CHAPTER TWO AFFECTED ENVIRONMENT

### INTRODUCTION

A description of the affected environment is presented in this chapter. The best available existing data were used; any significant data gaps which were found have been identified. Only baseline information necessary for understanding the impacts discussed in Chapter Three is included.

Only those impacts determined through analysis to be significant are examined in detail in Chapter Three. Therefore, the baseline information presented in this chapter describes only elements of each component for which significant impacts have been projected:

- Geology: The Lignite Resource
- Soils
- Air Quality
- Hydrology
- Land Use
- Social and Economic Conditions: Taxes and Royalties
- Noise

No significant impacts have been projected for the following components:

- Geology: Paleontology
- Climate
- Vegetation/Wildlife
- Cultural Resources
- Social and Economic Conditions: Population and Infrastructure
- Transportation

Criteria by which significance of impacts were evaluated are described at the beginning of Chapter Three. All components are summarized in Table S-1.

Background data, technical discussions, and impact analyses conducted on all components are on file and available for inspection at the New Mexico State Office of the Bureau of Land Management (BLM), Division of Planning and Environmental Coordination, 509 Camino de los Marquez, Santa Fe, New Mexico. They are also available as a Technical Report Volume at the six information centers listed in Chapter Four.

### GEOLOGY

Additional material on topography, geology, and paleontology is on file at the BLM New Mexico State Office, and the information centers listed in Chapter Four. The hydrogeologic setting is discussed in a later section of this chapter.

### The Lignite Resource

The lignite underlying the Camp Swift Military Reservation occurs in the Calvert Bluff Formation of the Lower Eocene Wilcox Group. In Bastrop County, the Calvert Bluff Formation reaches a maximum thickness of about 305 meters (1000 feet) (Barnes 1974). The most important commercial lignite beds occur in the lower third of the formation. Five distinct lignite-bearing strata are present throughout the region. On the proposed lease area, three of the five strata contain an estimated 70 to 90 million metric tons (80 to 100 million short tons) of lignite recoverable by surface mining methods. The thickness of individual, recoverable, lignite-bearing strata varies from 1.1 to 3.6 meters (3.5 to 11.8 feet). The other two lignite-bearing strata are too thin to be economically recoverable. [Lignite resource data provided by Lower Colorado River Authority (LCRA).] An overall weighted average of the lignite quality is given in Table 2-1.

Because only preliminary exploration activities have been conducted, detailed data on proven strippable lignite reserves in Bastrop County are not available at this time. Much of the data generated in these activities are proprietary. Kaiser (1974) estimated the near-surface potential lignite resource (as opposed to reserves) in Bastrop County to be about 407 million metric tons (447 million short tons). Using a recovery factor of 85 percent (Kaiser 1974), roughly 350 million metric tons (380 million short tons) of lignite are estimated to be recoverable by strip mining in Bastrop County. The estimated 70 to 90 million metric tons (80 to 100 million short tons) in the proposed lease area represent about 20 to 26 percent of this estimated recoverable resource.

There is currently no production of lignite in Bastrop County, although numerous small mines have been operated in the county in the past. Approximately 25 mines were periodically active in Bastrop County from 1886 to 1944 (Kaiser 1974). However, over 15,380 hectares (38,000 acres) of private lignite are currently under lease to eight different energy companies (see Related Projects, Chapter One). Data on production of lignite in Texas since 1970 are shown in Table 2-2. By 1985, statewide production is projected to be in excess of 45 million metric tons (50 million short tons) (Kaiser 1978).

### SOILS

A soil phase map of the Camp Swift mine area has been prepared from existing mapping by the U.S. Department of Agriculture Soil Conservation Service (SCS). The distribution of soil mapping units on Camp Swift may be seen in Appendix 3. Soil mapping unit descriptions, including chemical and physical charac-

**TABLE 2-1  
WEIGHTED AVERAGE LIGNITE QUALITY<sup>a</sup>**

| <b>Parameter</b> | <b>Value</b>   | <b>Units</b>          |
|------------------|----------------|-----------------------|
| Fuel Value       | 6330<br>(14.7) | Btu/lb<br>(Joules/kg) |
| Moisture         | 33             | Percent               |
| Ash              | 17             | Percent               |
| Volatiles        | 27             | Percent               |
| Fixed Carbon     | 23             | Percent               |
| Sulphur          | 1              | Percent               |

<sup>a</sup>From proximate analyses; data provided by LCRA.

**TABLE 2-2  
TEXAS LIGNITE PRODUCTION SINCE 1970**

| <b>Year</b>       | <b>Approximate Production</b> |                           |
|-------------------|-------------------------------|---------------------------|
|                   | <b>Million Metric Tons</b>    | <b>Million Short Tons</b> |
| 1970 <sup>a</sup> | 2.0                           | 2.25                      |
| 1972              | 3.7                           | 4.0                       |
| 1973              | 6.3                           | 6.9                       |
| 1974              | 7.0                           | 7.7                       |
| 1975              | 10.0                          | 11.0                      |
| 1976              | 13.0                          | 14.0                      |
| 1977 <sup>b</sup> | 14.0                          | 15.0                      |
| 1980 <sup>a</sup> | 27.0                          | 30.0                      |
| 1985 <sup>a</sup> | >45.0                         | >50.0                     |

<sup>a</sup>Estimated from plant capacity for present and scheduled plants.

<sup>b</sup>Preliminary U.S. Bureau of Mines estimation.

Source: Kaiser 1978

teristics, are summarized in Appendix Tables A3-1 and A3-2. The following discussion is based on the data from the soil survey report of Bastrop County by the USDA Soil Conservation Service (Baker 1979) and on extensive experience in evaluating soil characteristics for proposed mine areas in East Texas (TRRC 1977, 1979; Gavande et al. 1979).

Nineteen soil phases and nine soil series were identified within the study area based on SCS mapping units and correlations. Although two of these phases are regarded by the Soil Conservation Service as prime farmland units, none of these units are likely to meet historical land use criteria of the Office of Surface Mining (OSM) for prime farmland classification.

The soils are typified by a thin, fine sandy loam, fine sand, to loam horizon overlying a somewhat dense sandy clay loam to clay loam. These soils are generally low in organic matter and natural fertility. They are strongly acid to mildly alkaline in their reaction. The available water capacity is low to moderate. Runoff is slow, and permeability is slow to moderately rapid on most soils. Typical problems and limitations associated with these properties in certain units are low potential fertility, high erosion hazards, restrictive B-horizons, shallow droughty A-horizons, and slow water infiltration.

In the Axtell, Tabor, and Wilson soil series, the dense clay loam subsurface creates a boundary limitation confining moisture and root penetration to a relatively thin zone. The confinement is accentuated by the generally low water-holding capacity and poor fertility status of these and associated soils.

Soil erodibility factor for the surface soils in the lease area ranges from 0.17 (slightly) to 0.43 (moderately) erodible condition. The Axtell, Crockett, and Wilson soil series, which comprise about 68 percent of the total area, are highly erodible. Other series represented are moderately erodible. The weighted average soil erodibility factor for all series, based on a real distribution, is about 0.40. This corresponds to an overall, moderately erodible, soil condition.

Most soils in the lease area have a high proportion of silt and fine sand particles, are characterized by slow infiltration and percolation rates, and contain restrictive B-horizons. All these factors, when accompanied by steeper slopes, favor moderate to severe erosion conditions.

The production potential of the soil units varies widely for major land uses. The potential for cultivated crops is fair on most units because of low natural fertility and erosion hazard. Most of the soils have fair to good potential for pasture use. Most of the soil units in the survey area indicate a good potential for woodland. Controlling erosion, conserving moisture, and maintaining soil fertility are currently the main concerns of management for

woodland and pasture development in the soils on the Camp Swift area (Baker 1979).

Because topsoil has been removed by erosion or depleted of essential nutrients due to leaching, the availability of suitable topsoil material for use in post-mine reclamation may be an important factor.

Data on suitability of overburden material for supplementary use as topsoil or for topsoil mixing are not available from the Camp Swift area. Data on overburden characteristics from areas similar to the lease area indicate that overburden materials of the proposed mine area would range from slightly erodible to highly erodible (soil erodibility factor of 0.2 to 0.7), depending upon texture, structure, organic matter, permeability, and degree of consolidation of the material (Texas Railroad Commission 1977, 1979).

The distribution of grain size has a significant effect on the erosional hazards of the overburden. Some of the unweathered overburden material may contain a low percent of silt and fine sand fractions which erode more readily than the clay fraction. The initial overburden should resist erosion, but as weathering proceeds, the erosion potential will increase. Therefore, prediction of erosion hazards of the unweathered overburden will depend on the degree of weathering, which will change with time. Initial erodibility may be expected to be high. Overburden material may also be expected to have poor structure; low natural fertility; and low organic matter, nitrogen, phosphorus and certain micro-nutrients.

Except for description of lithologic logs, no data on physical and chemical properties of overburden material from the Camp Swift area are available. Interpretation of data from areas similar to the proposed mine area is provided with the background material. In general, it indicates that overburden from the proposed area would be low in organic matter, available nitrogen and phosphorus. The overburden material is expected to contain high concentrations of iron, zinc and manganese and low concentrations of molybdenum and copper.

## AIR QUALITY

The existing ambient pollutant background levels for the proposed lease area were estimated from data obtained at air quality monitoring sites located in a representative rural area approximately 65 kilometers southeast of the lease area. Background levels of total suspended particulate matter were estimated at 30 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) for the annual geometric mean and 95  $\mu\text{g}/\text{m}^3$  for 24-hour average concentrations. Background concentrations of sulfur dioxide were estimated at two  $\mu\text{g}/\text{m}^3$  for the annual arithmetic mean and 13  $\mu\text{g}/\text{m}^3$  for 24-hour average levels. An annual arithmetic mean concentration of 16  $\mu\text{g}/\text{m}^3$  was estimated for nitrogen dioxide. Background levels of ozone, carbon monoxide, and non-methane hydrocarbons were not estimated due to insufficient monitoring data.

## HYDROLOGY

### Groundwater

#### Hydrogeologic Setting

Shales and sandstones of the Eocene Wilcox Group underlie the proposed lease area. The Wilcox Group reaches a maximum thickness of about 800 meters (2,600 feet) in the southeastern part of Bastrop County. The Wilcox Group north of the Colorado River in Bastrop County is divided into three formations: the Hooper, the Simsboro, and the Calvert Bluff. The Carrizo Formation overlies the Wilcox Group and crops out east of the proposed lease area.

The major aquifers of concern in the proposed lease area are in the Simsboro and Calvert Bluff Formations. The hydrogeologic characteristics of these two formations are distinctly different. The Simsboro Formation is an excellent aquifer, whereas the Calvert Bluff Formation as a whole acts more as an impediment to groundwater flow (aquitard). However, the Calvert Bluff Formation, which contains the lignite beds to be mined, also contains sand units that serve as aquifers. Its aquifers are likely to be directly affected by mining activity.

Outcrops of Simsboro, Carrizo, and Calvert Bluff sands serve as groundwater recharge zones (Map 2-1). Outcrop areas of the Simsboro Formation to the northwest (updip) of the proposed lease area and the Carrizo Formation, southwest (downdip) of the proposed lease area are extensive. In contrast, sand units in the Calvert Bluff Formation which crop out throughout the Camp Swift lease area are small, discontinuous, and isolated within the dominantly clay strata. Sand units in the Wilcox Group and Carrizo Sand are hydraulically connected in the subsurface.

Most recharge to the Wilcox Group occurs in the outcrop belt, and water moves downdip to the southeast. Water in the outcrop belt is under water table conditions, but artesian conditions exist downdip, where the water-bearing strata are confined by overlying, less permeable strata. The potentiometric surface occurs below the top of the aquifer in the outcrop and slopes to the southeast (downdip). The rate of groundwater movement is about 3.1 to 30.5 meters (10 to 100 feet) per year (Follett 1970). Regionally, discharge from the Wilcox Group occurs mostly by upward leakage into overlying, less permeable strata, or by pumping from wells.

The Wilcox aquifer is full-to-overflowing; more water is rejected at the recharge zone than is taken into the aquifer. In the outcrop belt, much of the water that infiltrates the aquifer in upland areas is discharged into streams and as springs in lowlying areas. This natural discharge contributes to the baseflow of the streams crossing the Wilcox outcrop.

The Simsboro aquifer is the most important and productive aquifer underlying the Camp Swift area. The sands of the aquifer are primarily a very fine to medium-grained; the typical thickness is about 200 meters (650 feet) (Follett 1970). Hydraulic conductivity values measured northeast of Camp Swift in Milam County, range from 6 meters/day (150 gallons/day/square foot) to 14 meters/day (350 gallons/day/square foot) (Radian 1977). The storage coefficient of the Simsboro aquifer is approximately 0.0005, based on aquifer tests performed on a portion of the Simsboro Sand at Camp Swift (Guyton 1942).

The Calvert Bluff Formation is unconsolidated and is composed primarily of clayey and silty strata with a smaller proportion of sands. The complicated fluvial and deltaic stratigraphy of the formation make the detailed hydrology of the aquifer very complex. The sandy strata of the Calvert Bluff Formation are aquifers, but the formation as a whole is an aquitard because of its predominantly clay composition. Aquifer tests conducted in sandy strata in Milam County northeast of the proposed lease area indicate a range of hydraulic conductivity values of 0.1 meter/day (2.5 gallons/day/square foot) to 1.0 meter/day (25 gallons/day/square foot) (Radian 1977). The low values reflect the predominance of fine-grained materials (clay and silt) in the Calvert Bluff Formation. Pressure conditions in the Calvert Bluff Formation vary from unconfined (water-table) to semi-confined to confined (artesian), reflecting the complex stratigraphy of the formation.

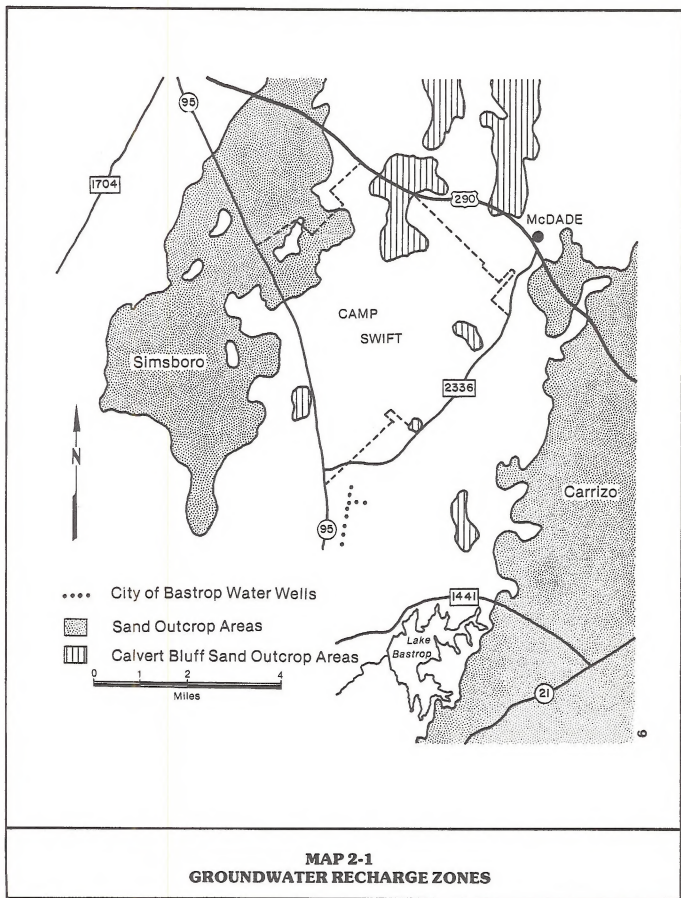
Water levels measured across the Camp Swift area during exploratory drilling in the Calvert Bluff Formation show that the water table configuration follows the topographic form of the land surface. A study of groundwater levels in the Calvert Bluff Formation in Milam County indicates that water flows downward from the Calvert Bluff into the Simsboro Sand (Radian 1977).

Current U.S. Geological Survey (USGS) plans for aquifer testing of the Calvert Bluff and Simsboro Formations at Camp Swift should provide more applicable data for characterizing hydrogeologic conditions in the proposed lease area.

#### Water Quality

Groundwater quality in the Wilcox Group aquifers is good (Follett 1970; Pattarozzi 1975). Water quality analyses show that groundwater in Bastrop County generally conforms to U.S. Public Health Service drinking water standards (Table 2-3).

Water from deeper parts of the aquifers in Bastrop County is more mineralized than shallow groundwater. The increase is caused by additional residence time and longer flow paths for deep groundwater as it moves through the aquifer. Although some groundwater sam-



**TABLE 2-3  
COMPARISON OF QUALITY OF GROUNDWATER  
FROM THE WILCOX GROUP IN BASTROP COUNTY  
WITH STANDARDS RECOMMENDED BY U.S. PUBLIC HEALTH SERVICE**

|                                    | Criteria for Public and Domestic Supply |              |                               |                  |                 |                               |  |         |
|------------------------------------|---|--------------|-------------------------------|------------------|-----------------|-------------------------------|--|---------|
|                                    | Silica<br>(SiO <sub>2</sub> )           | Iron<br>(Fe) | Sulfate<br>(SO <sub>4</sub> ) | Chloride<br>(Cl) | Fluoride<br>(F) | Nitrate<br>(NO <sub>3</sub> ) | Total<br>Dissolved Hardness<br>Solids as CaCO <sub>3</sub> |         |
| Upper Limits                       | 20 mg/l                                 | 0.3 mg/l     | 250 mg/l                      | 250 mg/l         | 0.8 mg/l        | 45 mg/l                       | 500 mg/l   | 60 mg/l |
| Total No. of Analyses              | 69                                      | 54           | 87                            | 89               | 46              | 85                            | 77   | 93      |
| No. of Analyses<br>Exceeding Limit | 53                                      | 40           | 14                            | 10               | 2               | 3                             | 39   | 79      |

Source: Modified from Follett 1970.

**TABLE 2-4  
TOTAL GROUNDWATER WITHDRAWALS FROM THE WILCOX GROUP FOR 1978**

| User                                | Purpose          | Million<br>Gallons | Million<br>Cubic Meters |
|-------------------------------------|------------------|--------------------|-------------------------|
| Bastrop                             | Municipal Supply | 572                | 2.2                     |
| Elgin                               | Municipal Supply | 153                | 0.58                    |
| McDade                              | Municipal Supply | 7.8                | 0.03                    |
| Elgin-Butler Brick Co. <sup>a</sup> | Industrial       | 21                 | 0.15                    |
| Texas Rendering Co.                 | Industrial       | 15                 | 0.1                     |

<sup>a</sup>1976 Data.

Source: Texas Water Development Board Groundwater Use Data File.

ples with high concentrations of sulfate or iron have been found, they cannot be attributed to any particular natural or artificial source.

#### Water Uses

The Wilcox and Carrizo aquifers are significant sources of water in Bastrop County. The Wilcox Group supplies water to the municipal systems of both Elgin and Bastrop, Texas. The Bastrop municipal well field is located just south of the proposed lease area. The wells were drilled for and used by Camp Swift during World War II (Map 2-1). Recent groundwater withdrawal data are given in Table 2-4.

In Bastrop County, the Wilcox aquifer also supplies minor amounts of water for industrial purposes to a rendering plant and a brick factory. Groundwater is the source for about one-half the irrigation water used in Bastrop County. In addition, numerous shallow wells completed in the Wilcox aquifer supply minor amounts of water for use by residents and livestock.

#### Surface Water

##### Stream Flow and Surface Water Quantity

Bastrop County is located in the Gulf Coastal Plain of south central Texas. The majority of the county is drained by the Colorado River and its tributaries; a small part of the county is drained by Yegua Creek, a tributary of the Brazos River.

The proposed lease area lies entirely in the Colorado River Basin. Primary drainage is provided by Big Sandy Creek, a perennial tributary of the Colorado. The northern section of the lease area is drained by Big Sandy and its tributary McLaughlin Creek. Dogwood Creek, also a tributary of Big Sandy, drains the southern section (Map 2-2). Both McLaughlin and Dogwood Creeks are intermittent streams with no flow several times a year.

The drainage area of Big Sandy Creek upstream of the point where it enters Camp Swift encompasses 15,670 hectares (60.5 square miles). This drainage area extends north into Williamson and Lee Counties and includes the small town of Butler. The McLaughlin Creek drainage area of approximately 2,850 hectares (11 square miles) extends eastward to the city of McDade. Dogwood Creek has a relatively small drainage area, 1,425 hectares (5.5 square miles), which does not encompass any major developments. These drainage areas are illustrated in Map 2-3.

USGS is currently conducting an extensive hydrological study in the Camp Swift area. As part of this study, stream gauging and water quality sampling stations were established on Big Sandy and Dogwood Creeks in May of 1979. In addition, rain gauging stations were also established in the area (USGS 1979). The

location of USGS gauging and sampling stations on Camp Swift are indicated on Map 2-2.

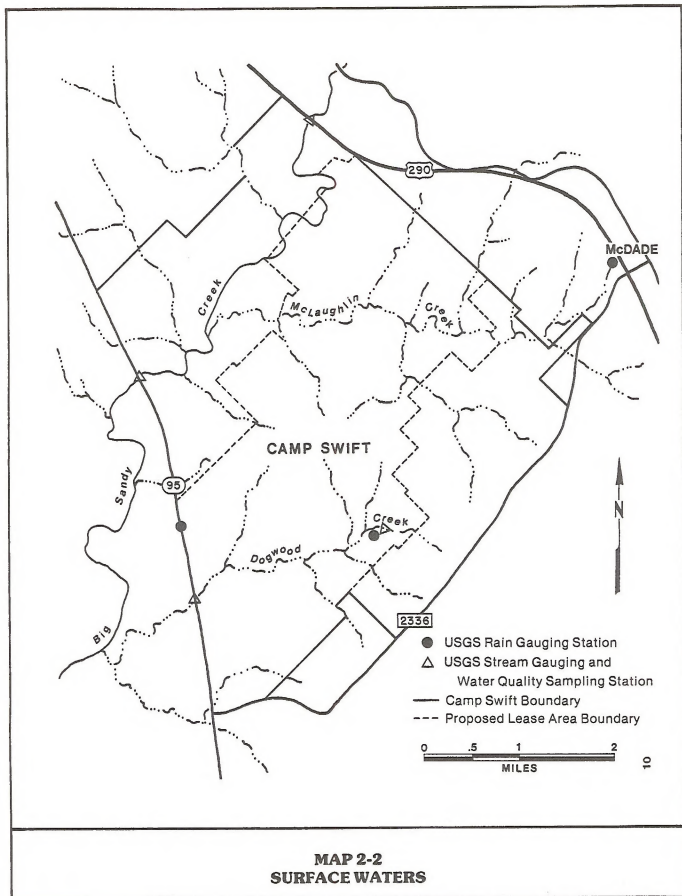
Discharge measurements obtained from the USGS stream gauges are presented in Table 2-5. As shown in Table 2-5, Dogwood Creek was dry over 50 percent of the sample dates. The large discharge measurements, 1.7 and 2.9 cubic meters/second (60.9 and 104 cubic feet/second), for Big Sandy Creek on January 22, 1980 coincide with a significant rainfall event, in which 2.54 centimeters (1 inch) fell in 24 hours. Measurements made in May 1979 are also probably due to recent heavy rainfall; however, rain gauge data are not available for this period.

Average discharges and flood frequency relations cannot be determined from these data due to the short period of record (less than 1 year). However, they can be estimated using alternative methods as shown later. Limited discharge measurements (6 sample dates) were made on Big Sandy Creek from August 1974 through March 1975 (Pattarozzi 1975). These data are presented in Table 2-6.

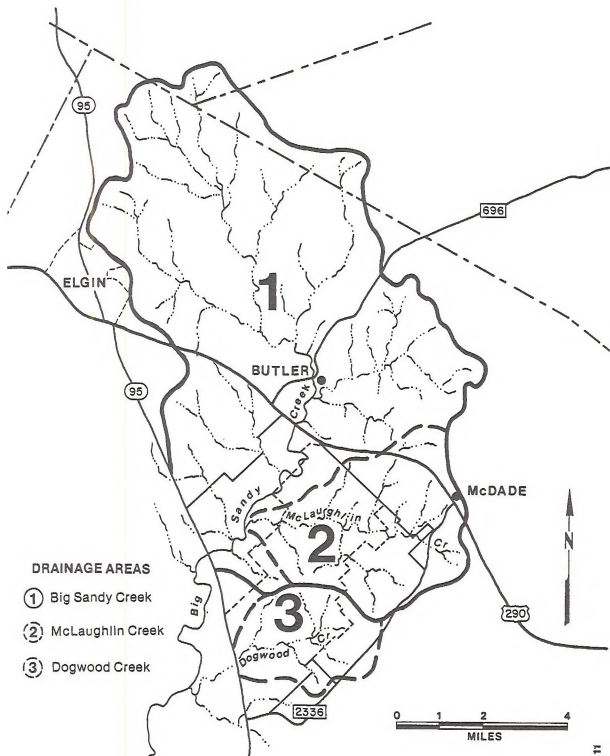
Limited discharge data for Big Sandy Creek prevented direct determination of its average flow rates. However, average flows for Big Sandy Creek and its tributaries were estimated by comparison with similar streams with long-term data records. Average discharge values estimated by comparison for Big Sandy, McLaughlin, and Dogwood Creeks are presented in Table 2-7. Values for the 25- and 100-year flood flows are also included in Table 2-7. These were determined using the USGS "Techniques for Estimating the Magnitude and Frequency of Floods in Texas" (USGS 1977). A detailed account of the determination of average flow and flood flows is presented in Appendix 4.

The stream gauges used for comparison include Willbarger Creek near Pflugerville, Texas, in the Colorado River Basin; Plum Creek at Luling, Texas, in the Guadalupe River Basin; Plum Creek at Lockhart, Texas, in the Guadalupe River Basin; Davidson Creek near Lyons, Texas, in the Brazos River Basin; Middle Yegua Creek near Dime Box, Texas in the Brazos River Basin; and East Yegua Creek near Dime Box, Texas in the Brazos River Basin. These surface waters are within 96.6 kilometers (60 miles) of the proposed lease area and receive similar rainfall throughout the year (USGS 1977). Land resource classifications and soil types around these creeks include the Blackland Prairies and Claypan Area, which are also of the classifications for Bastrop County (Texas A&M University, Department of Agricultural Communication 1973). All the creeks lie in the same flood frequency region, as specified by USGS (USGS 1977).

High values for flood flows in Big Sandy Creek prohibit using the average discharge as the median flow, i.e., the flow which is exceeded 50 percent of the time. The USGS data yielded a median discharge value of less than 0.11 cubic meter/second (4 cubic feet/second).







**MAP 2-3**  
**DRAINAGE AREAS OF SURFACE WATERS**

**TABLE 2-5  
USGS DISCHARGE MEASUREMENTS**

| Date of Measurement | Discharge in cubic meters/ second (cubic feet/ second) |        |                               |        |                              |         |
|---------------------|--|--------|-------------------------------|--------|------------------------------|---------|
|                     | Big Sandy Creek<br>Near McDade                         |        | Big Sandy Creek<br>Near Elgin |        | Dogwood Creek<br>Near McDade |         |
| 5-22-79             | 12.0   | (424)  | --                            | --     | 0.004                        | (0.015) |
| 5-23-79             | 1.0  | (35.3) | 2.02                          | (71.4) | --                           | --      |
| 7-13-79             | 0.07   | (2.52) | 0.13                          | (4.66) | --                           | --      |
| 7-17-79             | 0.04   | (1.38) | 0.05                          | (1.84) | --                           | --      |
| 9-6-79              | 0.03   | (1.20) | 0.003                         | (0.11) | --                           | --      |
| 9-28-79             | --   | --     | --                            | --     | No Flow                      | --      |
| 10-11-79            | 0.0005   | (0.02) | 0.001                         | (0.04) | --                           | --      |
| 10-15-79            | --   | --     | --                            | --     | No Flow                      | --      |
| 11-26-79            | --   | --     | --                            | --     | No Flow                      | --      |
| 11-28-79            | 0.0008   | (0.03) | 0.002                         | (0.09) | --                           | --      |
| 1-7-80              | --   | --     | --                            | --     | No Flow                      | --      |
| 1-9-80              | 0.017  | (0.60) | 0.02                          | (0.66) | --                           | --      |
| 1-22-80             | 1.81   | (63.9) | 2.94                          | (104)  | 0.05                         | (1.75)  |
| 1-23-80             | --   | --     | --                            | --     | <0.002                       | (<0.01) |
| 1-24-80             | --   | --     | 0.30                          | (10.6) | --                           | --      |
| 2-19-80             | --   | --     | --                            | --     | No Flow                      | --      |
| 2-20-80             | 0.07   | (2.59) | 0.10                          | (3.59) | --                           | --      |
| 3-27-80             | --   | --     | --                            | --     | 0.12                         | (4.44)  |
| 4-1-80              | 0.09   | (3.24) | 0.24                          | (8.64) | --                           | --      |

**TABLE 2-6**  
**DISCHARGE MEASUREMENTS AND WATER QUALITY DATA FOR BIG SANDY CREEK**

| Date     | Discharge in                     |        | Temp (°C) | pH  | Sulfate (mg/l) | Total Iron (mg/l) |
|----------|----------------------------------|--------|-----------|-----|----------------|-------------------|
|          | cubic met / sec (cubic ft / sec) |        |           |     |                |                   |
| 08-09-74 | 0.35                             | (12.5) | 26.5      | 6.7 | 38             | 0.64              |
| 09-02-74 | 0.12                             | (4.2)  | 26.0      | 6.6 | 148            | 2.40              |
| 11-14-74 | 0.49                             | (17.4) | 13.0      | 7.3 | 73             | 0.70              |
| 01-24-75 | 0.54                             | (19.1) | 11.0      | 7.0 | 175            | 0.45              |
| 02-12-75 | 0.68                             | (24.0) | 13.0      | 7.2 | 120            | 1.40              |
| 03-19-75 | 0.38                             | (13.5) | 20.0      | 7.4 | 225            | 0.10              |

Source: Pattarozzi 1975.

**TABLE 2-7**  
**ESTIMATED AVERAGE DISCHARGE FOR LEASE AREA SURFACE WATERS**

| Creek            | Drainage Area<br>ha <sup>1</sup> (sq. mi.) <sup>2</sup> | Average Discharge<br>m <sup>3</sup> /sec <sup>3</sup> (ft <sup>3</sup> /sec) <sup>4</sup> | Q25 <sup>5</sup><br>m <sup>3</sup> /sec (ft <sup>3</sup> /sec) | Q100 <sup>6</sup><br>m <sup>3</sup> /sec (ft <sup>3</sup> /sec) |
|------------------|---|---|--|---|
| Big Sandy Creek  | 15,670 (60.5)   | 0.56 (20)   | 382 (13,500)   | 590 (20,850)  |
| McLaughlin Creek | 2,823 (10.9)  | 0.12 (4.3)  | 128 (4,530)  | 192 (6,780)   |
| Dogwood Creek    | 1,424 (5.5)   | 0.06 (2.3)  | 87 (6,780)   | 126 (4,470)   |

<sup>1</sup>ha = hectares; 259 hectares = 1 square mile

<sup>2</sup>sq. mi. = square mile

<sup>3</sup>m<sup>3</sup>/sec = cubic meters/second; 0.028 cubic meters/second = 1 cubic foot/second

<sup>4</sup>ft<sup>3</sup>/sec = cubic feet/second

<sup>5</sup>Q25 = 25 year flood flow

<sup>6</sup>Q100 = 100 year flood flow

Lack of data prohibits quantitative determination of the area's flooding potential; however, it is known that flash flooding does occur in the late spring, summer, and early fall. Map 2-4 illustrates the flood hazard areas of the creeks draining the lease area. Flood hazard areas are approximately equivalent to 100-year floodplains. These areas would be inundated during a flood that has a one percent annual probability of occurrence. As Map 2-4 indicates, flows resulting from a flood with a 100-year return period or less are mostly confined near the channel areas in McLaughlin and Dogwood Creeks. Overflows from Big Sandy extend less than 305 meters (1,000 feet) from the creek bed (U.S. Department of Housing and Urban Development 1977).

#### Water Quality

Water quality data for Big Sandy Creek and its tributaries are limited. Data were collected during a two-year period (Pattarozzi 1974, 1975), and are being collected in the ongoing USGS study. Pattarozzi's data are shown in Table 2-6. A partial compilation of the USGS data collected to date is presented in Table 2-8. These raw data are on file at BLM/NMSO.

Available data indicate that water quality in Big Sandy and Dogwood Creeks is fairly good. The levels of iron and manganese are well within Office of Surface Mining Reclamation and Enforcement (OSM) effluent limitations, and total dissolved solids (TDS) and sulfate values are below federal secondary drinking water standards (OSM 1978; EPA 1979). While no data are available on the suspended solids levels in the creeks, visual inspection indicates that Big Sandy carries a high sediment load (Covar 1980). This is somewhat supported by the high turbidity values in the USGS data.

Estimates of the sediment load carried to Big Sandy from McLaughlin and Dogwood Creeks under existing conditions were made using the Universal Soil Loss Equation (Haan 1978). The equation yields values of 369 and 186 metric tons/year (407 and 205 short tons/year) for McLaughlin and Dogwood Creeks, respectively. This represents a flow-weighted average sediment concentration of 100 milligrams per litre (mg/l). A detailed account of this sediment load determination method is presented in Appendix 4.

Water used in the area is mainly groundwater. Currently, the Texas Department of Water Resources (TDWR) lists no water usage claims or permits on Dogwood, McLaughlin, or Big Sandy Creeks (TDWR, 1980), and no discharges are presently permitted on Big Sandy, McLaughlin, or Dogwood Creeks (TDWR 1980).

#### LAND USE

Camp Swift is licensed by the Department of Army to the Texas National Guard. Most of the area is used solely for military training activities, including tank maneuvers, airfield use, parachute drops, and firearm and artillery practice.

Unexploded World War II ordnance, primarily 75 millimeter anti-tank rounds and bazooka rounds, periodically have been found on Camp Swift. Ordnance is usually found on top of the ground or very near the surface, still "live" in spite of its age and weathered condition. No concentration of ordnance is known--it has been found widely scattered over the proposed lease area (Fisher 1980).

Small portions of Camp Swift are occupied through lease or easement by other uses. State Farm-to-Market (FM) Road 2336 cuts across Camp Swift's southern tip. Part of the 34 hectare (85 acre) area separated from the body of the camp by FM 2336 is leased (23 hectares; 56 acres) by the University of Texas System for use as a Cancer Research Center. This tract is used for grazing test animals used for scientific research. It is also part of the Center's overall drainage network on the property, and figures prominently in their pasture management program (Keeling 1980). This land is not part of the proposed lease action, but is included in the larger area alternative (see Map 1-2). The U.T. System lease expires December 31, 1984. The U.T. System is attempting to negotiate an additional, longer term lease on the tract. DOA stipulations on the present lease allow TANG to use the area for maneuvers "at any time without prior notice" (Corps of Engineers, 1980).

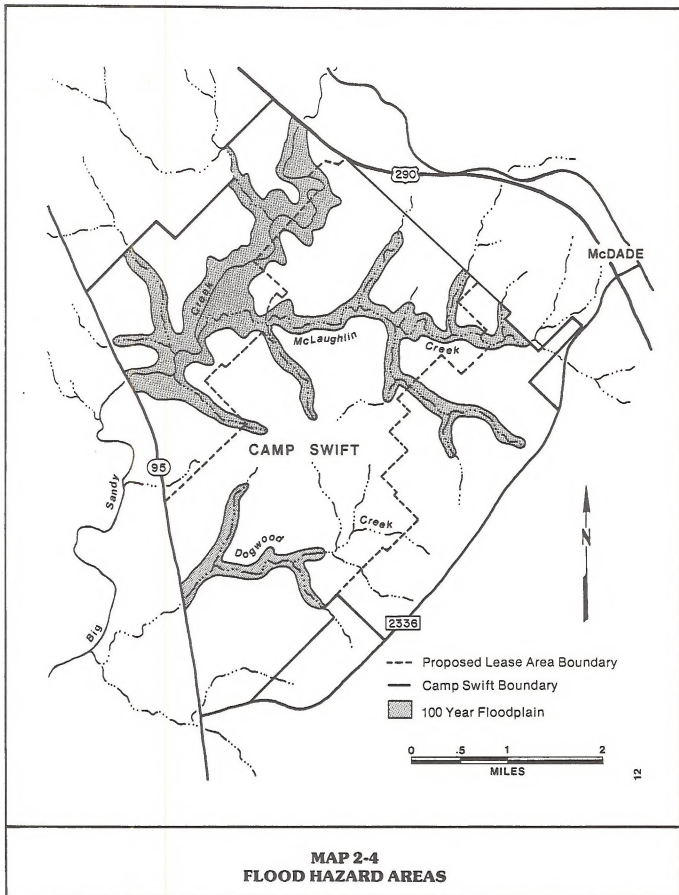
Existing land use in the Camp Swift area is shown on Map 2-5. Not specifically shown on the map are a few scattered residences along U.S. 290, State Highway 95, and FM 2336 (see Map 3-2 for schematic location).

#### Visual Resources

The visual resource of Camp Swift is not in any direct use such as recreation. It does contribute to the visual character of the area and is viewed by people traveling the roads that form the boundary of the military reservation. The visual resource was evaluated according to the BLM Visual Resource Management System (VRM) which divides the analysis of the visual resource into three major components: scenic quality, visual sensitivity, and viewing distance.

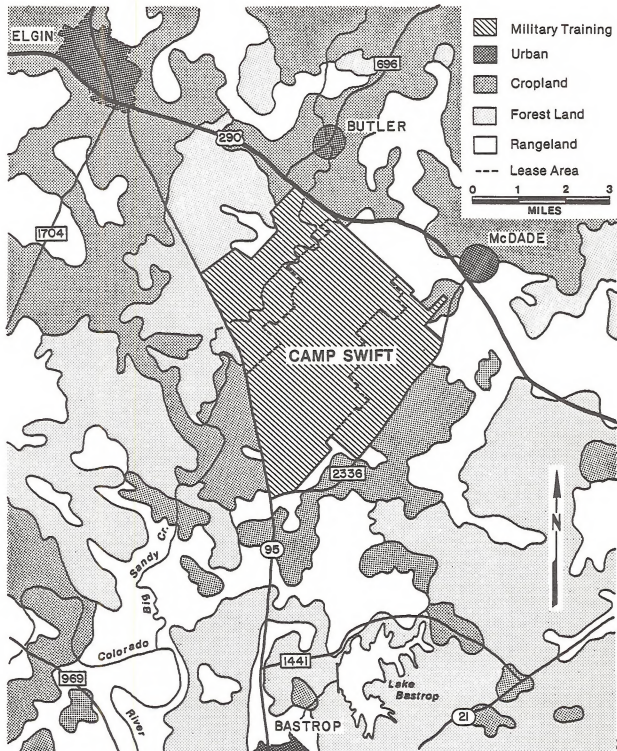
The scenic quality is a function of the visual variety and interest of landscape features (i.e., land form, vegetation, water, and structures) and also considers the context of the area. The evaluation is dependent on personal judgement to a small degree; however, the guidelines ensure close agreement among various analysts. Camp Swift is evaluated to have a low scenic quality.

The visual sensitivity is a function of the number and types of viewers that frequent the area. Viewer sensitivity, determined by the type of viewer involved, is an indication of attitudes toward the landscape. Viewer sensitivity for Bastrop County is low as determined by public response at the scoping meetings. The number of viewers is high due to traffic volumes on adjacent roadways. These combine to give medium sensitivity for Camp Swift.



**TABLE 2-8  
USGS WATER QUALITY DATA**

| <i>Sampling Station</i>        | <i>Date</i> | <i>Temp (°C)</i> | <i>pH</i> | <i>Turbidity (NTU) EPA</i> | <i>Dissolved Iron (mg/l)</i> | <i>Dissolved Manganese (mg/l)</i> | <i>Dissolved Sulfate (mg/l)</i> | <i>Cations (MEQ/l)</i> | <i>Anions (MEQ/l)</i> | <i>Total Dissolved Solids (mg/l)</i> |
|--------------------------------|-------------|------------------|-----------|----------------------------|------------------------------|-----------------------------------|---------------------------------|------------------------|-----------------------|--------------------------------------|
| Big Sandy Creek<br>Near McDade | 11-28-79    | 12.5             | 7.2       | 2.6                        | >0.01                        | 5.4                               | 64                              | 7.36                   | 7.64                  | 454                                  |
|                                | 1-22-80     | 11.0             | 7.3       | 620                        | 0.02                         | 0.310                             | 87                              | 4.67                   | 4.96                  | 303                                  |
|                                | 3-28-80     | 16.5             | 6.7       | 230                        | --                           | --                                | --                              | --                     | --                    | --                                   |
| Big Sandy Creek<br>Near Elgin  | 11-28-79    | 11.0             | 6.9       | 7.7                        | 1.2                          | 0.65                              | 20                              | 3.27                   | 3.12                  | 210                                  |
|                                | 1-22-80     | 11.5             | 7.3       | 220                        | 0.28                         | 0.16                              | 76                              | 3.736                  | 3.720                 | 240                                  |
|                                | 3-28-80     | 15.3             | 7.0       | 300                        | --                           | --                                | --                              | --                     | --                    | --                                   |
| Dogwood Creek<br>Near McDade   | 1-22-80     | --               | 7.2       | 260                        | 0.30                         | 0.005                             | 2.1                             | 0.640                  | 0.542                 | 56                                   |



The dense vegetation along the roadways bordering the reserve prevent visual access to the vast majority of Camp Swift. The exceptions are occasional open or meadow areas adjacent to the roads. The majority of the reservation is not visible from any areas of public access and, therefore, is classified as "seldom seen."

According to the VRM guidelines the entire reservation is management class IV. This is a relatively unrestricted classification as expressed in the BLM Manual Section 8411.6, C-5:

**"Class IV.** Contrasts may attract attention and be a dominant feature of the landscape in terms of scale; however, the change should repeat the basic elements (form, line, color, texture) inherent in the characteristic landscape."

## **SOCIAL AND ECONOMIC ENVIRONMENT: TAXES AND ROYALTIES**

Legal and organizational mechanisms do not now exist to require a tax-exempt entity to make royalty payments to local governments in Bastrop County in "compensation" for impacts of Camp Swift lignite mining. Local attitudes in response to this situation are the focus of discussion in this DEIS. Non-significant social and economic impacts, on population, housing, infrastructure, etc., are summarized in the background material available for inspection at BLM/NMSO and the six public information centers listed in Chapter Four.

### **The Growth Issue**

Results of a survey conducted in 1979 reveal that surface mining is a controversial issue in Bastrop County (Dietrich 1980). Personal interviews were conducted with 50 resident property owners, who were randomly selected from deed records on file at the Bastrop County clerk's office. Twenty-three (46%) of the residents surveyed favored surface mining, citing the need for developing local energy resources, economic gains to the landowner, and the belief that the reclaimed landscape will be viable for cattle grazing. Nineteen of the residents surveyed (39%) opposed surface mining, expressing concern over increased levels of noise, dust, and traffic from mining activities. This group also felt surface mining would lead to a despoiled landscape and doubted that reclamation would return mined land to a productive or aesthetic state. A neutral opinion was expressed by the remaining 15 percent.

According to the survey, long-time residents of Bastrop County tend to favor surface mining more than do newcomers to the county. Many long-time residents experienced the land use transition from cotton to cattle and perceive surface mining as the next profitable use of their land. This group is more inclined to accept a reclamation program than returns the land to managed pasture for cattle grazing.

Many short-term residents were initially attracted to the area by the amenities and rural lifestyle that Bastrop County offers. This group envisions surface mining as destroying the qualities that they found in the county. Many people in this "amenity seeking" group derive their income from nonagricultural sources. Their property is residential property rather than a means to a livelihood. Many people in this group are former city dwellers who are well pleased with their new-found rural lifestyle.

Comments of Bastrop County residents attending public meetings on the Camp Swift leasing action held in July, 1979, and April, 1980 suggest that development of Camp Swift lignite remains a controversial issue. Residents near Camp Swift are concerned that surface mining activities may depress the value of their property. Some residents are concerned about the ecological damage resulting from surface mining. Another faction in the county feels that since the public is not allowed access to Camp Swift, the mining will cause minimal adverse effects.

### **The Fiscal Issue**

The experience of lignite development in Texas communities has highlighted the relationship between economic benefits resulting from a project and local acceptance of a lignite mining operation (Baeke 1976). When adequate tax revenues will be generated by a mining activity, local residents and community leaders have generally not opposed the mining project (Duke 1978). Private sector mining companies extracting lignite on private lands are subject to local taxes which can be used by local governments to improve roads and to provide services to meet the demand of the population growth generated by the project.

In Texas, there are specific circumstances under which the local government is not able to levy property taxes. For example, the federal government, the University of Texas, and municipal power authorities (such as those eligible under the Federal Coal Leasing Amendments Act of 1976 to obtain the proposed Camp Swift coal lease) are exempted by state law from local property taxes.

### **Existing Taxes in Bastrop County**

Property taxes in Bastrop County are levied by the three major cities (Elgin, Bastrop, and Smithville), the school districts, and the county. The effective tax rate for the combined school districts in Bastrop County is less than half the state average (Texas Research League 1979). In 1977 Bastrop County had a lower property tax rate than surrounding counties in central Texas (CAPCO 1978). The principal taxpayers in 1977 were Southwestern Bell Telephone Company, Elgin-Butler Brick and the Missouri, Kansas and Texas Railway Company. The three companies contributed 6.4 percent of the County's property tax.



There are several major federal and state land holdings in the county, some of which have experienced major development activity in recent years. This tax-exempt property includes the federally-owned land at Camp Swift and the Federal Youth Correctional Facility, state-owned land at the University of Texas Cancer Research Center and at the two state parks, and the property in the vicinity of Lake Bastrop and the Gideon Power Plant owned by the Lower Colorado River Authority.

Property tax rates and revenues per capita of the taxing jurisdictions in Bastrop County are less than state averages. In May, 1980 the Bastrop County Commissioners adjusted the county tax assessment ratio causing a 25 percent tax increase to local taxpayers. This increase was necessary to cover a projected \$200,000 deficit in the 1981 budget, the major portion of which is caused by road construction and maintenance.

## NOISE

### Levels and Sources

The Camp Swift Military Reservation and vicinity have sound levels typical of rural areas of the United States.

On a county wide basis, population density is about 8.7 people per square kilometer (22.5 people per square mile) (Texas Almanac). If the population of Elgin, Smithville, and Bastrop are subtracted to more appropriately represent the rural setting around Camp Swift, the density is reduced to about 4.1 people per square kilometer (10.7 people per square mile).

For the most part, major sources of noise in the Camp Swift area are from wind and vegetation interaction, birds and insects. During military training exercises, noise is generated by military equipment operation and weapons. Levels of noise associated with this activity are a function of the scale of the exercise and were not estimated.

Occasional complaints have been lodged with the Texas Army National Guard (TANG) concerning noise from weapons firing. These complaints were made by residents closest to the part of Camp Swift being used for weapons firing.

In the area around Camp Swift, major noise sources in descending order from the highest level are:

- Missouri-Kansas-Texas (MKT) Railroad
- Southern Pacific Railroad
- U.S. Highway 290 (4150 vehicles/day)
- State Highway 95 (1260 vehicles/day)
- Farm-to-Market Road (FM) 2336 (430 vehicles/day)

Each of these transportation components will contribute to the sound level near its right-of-way.

The Camp Swift area has prevailing sound levels of about 40 dBA\* with bands of noise along the railroads and highways ranging from about 60 to 90 dBA for railroads and 50 to 65 dBA for highways. Baseline calculations of noise are shown in Appendix 6.

A single train passage will dominate the sound field for a short time. Noise levels associated with train passage typically range from 86 dBA (rail car noise level) to an average of 94 dBA for locomotive noise at a distance of 30 meters (100 feet). These values are for trains passing at speeds of greater than 72 kilometers (45 miles per hour) (Kurjweil 1979). The values will vary substantially with grade and train speed, but this range will be considered typical in this DEIS.

Noise levels of about 68 dBA for locomotive noise and 60 dBA for train car passage have been calculated at 610 meters (2000 feet). The time during which these levels will be experienced is a function of train speed and length. If it is assumed that six MKT trains hauling 110 cars at 72 kmph (45 mph), pass through the area each day, a point along the railroad 610 meters (2000 feet) away could conceivably experience a 60 dBA noise level for about 12 minutes per day. In the case of the Southern Pacific, time of 60 dBA exposure at 2000 feet is about one minute per day.

Noise levels near the highway are dictated by number of vehicles, speed, grades, and type of vehicles. Passing traffic may produce noise levels ranging from 60-65 dBA within 30 meters (100 feet) of the highway.

### Time of Day, Season of Year

Natural noises will not change substantially with time of day or season in the Camp Swift vicinity. Predominant natural noises (wind-vegetation interaction, insects, or birds) are occurring about equally on a daily and seasonal basis.

Noise levels from human sources are higher during daytime periods than during the night. Vehicular movement and farming activity occur predominantly during daylight hours.

### Noise Receptors

Human receptors of existing railroad and highway noise are inhabitants living within 610 meters (2000 feet) of railroads and 150 meters (500 feet) of highways. These include the University of Texas Cancer Research Center occupants and some residents along the north-eastern, southern, and western edges of the Camp Swift Military Reservation boundaries.

No known wildlife species sensitive to existing noise levels are known to be present.

\* dBA refers to a measured value of sound that approximates the hearing response of humans.



## CHAPTER THREE ENVIRONMENTAL CONSEQUENCES

### INTRODUCTION

The proposed action and alternatives are described in detail in Chapter One. Chapter One also describes requirements which would be placed upon the lessee of Camp Swift lignite. These requirements are based on two assumptions:

1. All applicable Federal, State, and local regulations and laws would be part of the Proposed Action and Larger Area Alternatives;
2. All lease stipulations included in the Proposed Action and Larger Area Alternative would be complied with.

Impact analysis in Chapter Three is also based on these two assumptions.

Project components predicted to result from the lease action and therefore considered in the analysis of impacts and net energy use are: (1) construction of on-site mining facilities, (2) extraction of the lignite resource from approximately 1620 hectares (4000 acres) within the lease area using surface mining methods, (3) reclamation of the mined and disturbed areas in compliance with applicable regulations, and (4) transportation of the extracted lignite by one of three alternative methods: truck haulage, conveyor, or rail haulage.

Total time for the construction, operation, and reclamation would be 35 years.

Table 3-1 lists the environmental components and sub-components considered in impact analysis. Only those determined to be significantly impacted are discussed in this chapter. (Table S-1 at the end of the Summary summarizes impacts to all components).

Criteria used to determine the significance of impacts on each component are summarized below. Where data were insufficient to predict impacts, a "worst-case" situation was analyzed.

Impacts on components determined to be nonsignificant (e.g., paleontology, vegetation, wildlife, cultural resources, population and infrastructure, and transportation) are discussed in the background material. This material is on file and available for inspection at BLM New Mexico State Office (BLM/NMSO) and the six information centers listed in Chapter Four.

### CRITERIA USED IN DETERMINATION OF IMPACT SIGNIFICANCE

#### Geology / Paleontology / Mineral Resources

Geologic impacts would be considered significant if land disturbance caused by the proposed construction and mining resulted in conditions observably different from surrounding features, created a hazard, or destroyed a particularly valuable geologic resource. Analysis has determined that none of these impacts would occur.

Paleontology impacts would be significant if there was a high potential of scientifically valuable resources being destroyed. Analysis indicates that although some scientifically interesting resources would be lost, this impact would not be significant since similar fossils are common throughout the region.

Impacts on mineral resources would be deemed significant if the proposed action or larger area alternative results in direct destruction of a resource, or permanent elimination of a valuable resource from possible future recovery. Mining would result in permanent removal of 81 million metric tons (90 million short tons) of lignite under the proposed action and an additional 2.4 million metric tons (2.7 million short tons) under the larger area alternative.

#### Soils

Impacts on soils would be significant if the proposed action or larger area alternative resulted in the greater than normal loss or alteration of productivity of limited soil resources despite standard reclamation and recovery efforts. Impact analysis indicates that these criteria would be met because increased erosion and loss of already limited topsoil would occur and natural structure and productivity would change.

#### Climate

Impacts on regional or local climate would be significant if the proposed action or larger area alternative resulted in a change of greater than 5 percent in temperature, humidity, and/or wind speed. Impacts on the microclimate would be significant if a change of greater than 30 percent were expected. Impact analysis has determined that changes would not reach these levels.

**TABLE 3-1**  
**ENVIRONMENTAL COMPONENTS CONSIDERED IN IMPACT ANALYSIS**

---

**Geology**

- Structure
- Stratigraphy
- Topography
- Paleontology
- Geologic Hazards
- Seismic Risk
- Overburden Properties
- Mineral Resources

**Soils**

- Altered Soil Conditions
- Mixing of Overburden and Rocks with Surface Soil
- Soil Loss Due to Erosion
- Sediment Loss Due to Erosion and Runoff
- Land Use Capacity and Productivity
- Temporary/Permanent Loss of Land from Current Use

**Climate/ Air Quality**

- Microclimate
- Visibility
- Temperature
- Growing Season
- Humidity
- Precipitation
- Winds
- Dispersion Conditions
- Severe Weather
- Cloud Cover/Sunshine
- Droughts
- Total Suspended Particulates (TSP)
- Sulphur Dioxide (SO<sub>2</sub>)
- Nitrogen Oxides (NO<sub>x</sub>)
- Carbon Monoxide (CO)
- Non-Methane Hydrocarbons (NMHC)

**Ground Water**

- Local Dewatering of Aquifers
- Destruction of Aquifers
- Change in Recharge Characteristics
- Increase in Groundwater Demand
- Potential for Interception of Simsboro During Mining

**Water Quality**

- Decrease in Dissolved Oxygen (D.O.)
- Increase in Total Dissolved Solids (TDS)
- Change in Temperature
- Decrease in pH
- Increase in Sediment Load
- Increase in Biochemical Oxygen Demand (BOD)
- Increase in Iron and Manganese
- Radioactivity
- Increase in Salinity

**Stream Flow and Surface Water Quantity**

- Increase in Flooding Potential
- Interference with Downstream Use
- Decrease in Waste Assimilative Capacity
- Increased Load on Municipal Waste Treatment Plants
- Rerouting of Stream Channels

**Natural Vegetation**

**Wildlife**

**Aquatic Life**

**Biologically Sensitive Areas**

**Historic and Archaeological Sites**

**Land Use**

- Military Use
- UT Cancer Research Center
- Private Lease Lands
- Recreation
- Agricultural Use
- Visual Resources
- Local Growth Controls
- Ordnance Hazard

**TABLE 3-1**  
**ENVIRONMENTAL COMPONENTS CONSIDERED IN IMPACT ANALYSIS**  
**(continued)**

---

**Social and Economic Environment**

- Population Increase
- Economic Effects
- Schools
- Utilities
- Housing
- Water
- Public Attitudes

**Transportation**

- Railroads
- F.M., County Roads & Bridges
- City Streets
- State & U.S. Highways
- Accidents
- Pipelines & Transmission

**Noise**

- Mining
  - Transportation
-

## Air Quality

Dispersion modeling was used to assess air quality impacts. Pollutant concentration levels set by National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) rules were compared to concentrations of pollutants predicted to result from the proposed action or larger area alternative. Impacts would be significant if predicted concentration levels were within 25 percent of levels established by NAAQS or the PSD increments. During mining activities, the annual secondary NAAQS and the annual and 24-hour PSD increments may be exceeded in areas outside the lease boundaries when mining occurs near the lease boundaries.

## Water

Impacts on groundwater resources would be significant if the proposed action or larger area alternative threatened the quality of groundwater supply in Bastrop County, or if aquifers would be dewatered, destroyed, or if recharge characteristics were altered. Impacts to groundwater were determined to be significant because the quantity of water in aquifers would be altered and quality for consumptive uses could be threatened.

Impacts on surface water quality would be significant if large-scale changes in existing quality resulted in violation of federal or state water quality standards. For surface water, these changes include: a substantial increase in total dissolved solids, biochemical oxygen demand (BOD), sediment load, iron, manganese, radioactivity, and/or salinity; a substantial decrease in dissolved oxygen or pH; or any radical change in water temperature. Analysis indicates no significant impacts to surface water quality.

Impacts on surface water quantity would be significant if (1) existing flow of perennial streams in the lease area were reduced to levels affecting downstream use, (2) flows increased sufficiently to result in noticeable changes, (3) if flooding potential increased, (4) if waste assimilative capacity of the area decreased, (5) if excessive demands would be placed on municipal water and wastewater facilities due to project-related population growth, (6) if changes in water quality would affect current stream uses, or (7) if any water quality standards would be violated. Analysis indicated that lease area streamflow patterns would be significantly increased during mining.

## Vegetation and Wildlife

Impacts on biological resources would be significant if the proposed action or larger area alternative resulted in the removal of resources of high ecological, aesthetic, or recreation value not prevalent outside the project area, and if such removal could not be expected to be satisfactorily mitigated by reclamation and restoration.

The removal of biological resources on the proposed lease site during mining and reclamation would not be significant because (1) vegetative and wildlife communities occurring on Camp Swift were found to occur throughout broad areas of central and east Texas and (2) long-term recovery of these resources is projected to be highly probable.

State Threatened and Endangered Species were evaluated individually in impact analysis. Federal Threatened and/or Endangered Species were evaluated individually in impact analysis, and results were reported in a special biological assessment (see Appendix 5). No federal or state threatened or endangered species are known to occur on Camp Swift.

## Cultural Resources

Impacts on historic and prehistoric resources would be significant if the proposed action or larger area alternative resulted in damage or destruction of sites of scientific or cultural value.

The stipulations to be included with the lease will provide for the recovery of information values of the resource on the lease site. The existing military land use has severely affected the value of these resources to date.

## Land Use

Land use impacts would be significant if the proposed action or larger area alternative resulted in (1) direct disruption of a valuable existing land use, (2) a substantial increase in demand for developed land uses, and/or (3) distinct conflicts with existing land use plans. Analysis indicates that only the larger area alternative would meet any of these criteria; under that alternative use of a 23 hectare (56 acre) tract by the University of Texas would be disrupted. Potential impacts to the visual resource were considered significant if they exceeded the VRM Class IV contrast rating designated for Camp Swift:

**"Class IV.** Contrasts may attract attention and be a dominant feature of the landscape in terms of scale; however, the change should repeat the basic elements (form, line, color, texture) inherent in the characteristic landscape." (BLM Manual, Section 8411.6, C-5).

Impact analysis indicates that visual standards could be exceeded for a short period of time, particularly when mining is near the lease boundaries.

## Social and Economic Environment

Social and economic impacts would be significant if either action resulted in (1) greater than a 10 percent sustained annual population increase from immigration,

(2) a serious housing shortage or overloading of community facilities, or (3) inadequate tax or royalty revenues to pay for growth costs.

Analysis indicates that Austin, Texas, would absorb most of the population and necessary infrastructure that would accompany development of the Camp Swift lease. Controversy over pro-growth and taxation issues are significant.

#### **Transportation**

Impacts on transportation systems would be significant if the proposed action or larger area alternative resulted in a 40 percent or greater increase in usage of any off-site transportation facility, resulting in extensive damage (sufficient to cause maintenance cost increases), and a 10 percent or larger increase in accidents. Transportation impacts were also considered significant if a "threshold" of acceptable usage (volume) would be exceeded by implementing either action. Impact analysis indicates these levels would not be exceeded.

#### **Noise**

Noise impacts would be significant if receptors (residences, churches, schools, etc.) were exposed to an equivalent day-night sound level in excess of 55 decibels (dBA). Typical rural background levels in the Camp Swift area range from 35 to 40 dBA. Impact assessment indicates that mining could generate significant noise levels.

#### **Short Term and Long Term**

For this DEIS "short term" is the period of construction, mining, and reclamation; "long term" is the post-mining/reclamation period.

#### **NET ENERGY ANALYSIS**

The potential net energy production for the proposed action was also evaluated as part of the environmental impact assessment. Its energy inputs and outputs were then compared to other coal options. The results of the net energy analysis are briefly summarized below. Details of the analysis, including assumptions, data bases, methodology, calculations, and findings, are provided in the net energy analysis background materials to the DEIS (available for inspection at BLM/NMSO and the six information centers listed in Chapter Four).

#### **Energy Costs of Camp Swift Lignite Mining**

Total capital energy requirement (the energy consumed to manufacture the mining equipment and facilities) is  $1,998.4 \times 10^9$  (billion) Btu over the 30-year life of the mine. Operating energy inputs, including elec-

tricity and fuel to operate the equipment as well as the energy required to manufacture the materials used during mining, total  $760.9 \times 10^9$  Btu per year.

After capital energy inputs are annualized and added to annual operating energy inputs, energy inputs for the mining step alone total  $737.2 \times 10^9$  Btu per year. Since the mine is expected to produce  $37,980 \times 10^9$  Btu per year of lignite, it is producing 50.9 times more than is consumed in production. Thus, 50.9:1 is the net energy ratio for the mining step. The electricity used to operate mining equipment and machinery is 57.7 percent of total energy costs, and operating energies account for 90.0 percent of the total.

#### **Energy Costs of Lignite Mine-Power Plant System**

For the assumed Camp Swift mine-power plant combination, energy input totals  $2,473.0 \times 10^9$  Btu per year. Thirty percent of this energy is consumed in the mining step, and 70.0 percent is consumed in the conversion of lignite to electric power. The system produces  $12,362.5 \times 10^9$  Btu of electricity per year (equivalent to  $3.62 \times 10^9$  kilowatt-hours per year). Consequently, over its 30-year life, the system will deliver 5.0 times more electricity and 15.3 times more fossil fuel equivalents than are required to build and operate it.

#### **Comparison of Energy Costs of Lignite Development with Other Coal Alternatives**

Net energy ratios for surface and underground western coal mines range from 40:1 to 60:1; the Camp Swift lignite mine is intermediate at 51:1. The net energy ratio for lignite-fired electric power plants (50:1) is within the range for other coal-fired systems.

These ratios indicate that lignite development will produce a net amount of energy comparable to alternative forms of energy development. However, these data do not account for site-specific transportation differences. Since higher grade western coal must be transported to Texas (as coal or as electricity), lignite development in Texas probably produces more net energy than western coal when energy used during transport to Texas is taken into account.

#### **PROPOSED ACTION**

##### **Geology: Lignite Resources**

About 81 million metric tons (90 million short tons) of lignite would be recovered after mining is completed if Camp Swift lignite is mined. This is about 25% of the estimated recoverable lignite resource in Bastrop County, and about 60% of that underlying the lease area. As much as 55 million metric tons (60 million short tons) of lignite could be lost due to limitations of mining

technology and economic constraints to recovery of thin seams in the overburden. This would be an irreversible result of mining this non-renewable resource. Assumptions for estimating the resource are described in the background material. (See also Cumulative Impacts Section of this chapter).

## Soils

### Assumptions and Analysis Guidelines

It is assumed that the reclamation procedures would be in compliance with OSM performance standards (see Reclamation Model description, Chapter One). Therefore, topsoil material would be stripped in advance of mining, stockpiled and protected, and respread over leveled overburden material. However, topsoil and overburden mixing is currently practiced on active mining sites in Texas and is allowed by regulations provided that the best suitable material as a medium for plant growth is used for the final topsoil cover. The final back-filled areas would be graded and contoured to blend with surrounding topography with slopes approximately those before mining and to provide satisfactory drainage. Limited data are available on overburden suitability as supplementary topsoil or for use in topsoil mixing. Therefore a worst case analysis is made.

### Short Term Impacts

Soils on the lease area and possibly outside the lease area (e.g., rail loop, sediment containment basins, haulage or belt conveyor corridors, etc.) would be stripped, stockpiled and respread upon reclamation of disturbed areas. Because of the inherent high erodibility of certain soils in the lease area, there would be loss to sedimentation basins from initial clearing through final revegetation stages. This material would not be fully recoverable in sedimentation basins, due to mixing with eroded overburden material. Those inherent losses are significant since there already is an indication of limited suitable topsoil availability. Regulations require that at least the upper six inches of soil including the B-horizon be segregated and saved for use in reclamation, which should help to maintain the initial productivity potential of mined lands in the post-mining phase.

During the process of stripping, the natural soil structure would be broken up, soil compaction would cause lower permeability, soil microorganisms would be buried, with nutrient cycling and established soil-water-plant relationship completely altered.

The major significance of these changes in the proposed mine area relates to their potential effect on plant growth in the reclamation phase. Some changes may be adverse to plant growth, and some may aid reestablishment of vegetative cover.

In situations where the soil A-horizon is shallow and underlain by a relatively impermeable and slightly consolidated silty clay B-horizon (hardpan), physically breaking up these restrictive horizons would result in improved infiltration capacity and root penetration.

The geochemical data (TRRC 1976, 1977) on overburden materials from areas of the Texas lignite region similar to the study area, suggests that if any acid-producing or toxic materials are present in the overburden, they will most likely occur in strata immediately adjacent to the lignites, and especially in the interburden proximal to lignites. Overburden removal could bring to the surface and mix with the soil those elements that at sufficient concentrations are either toxic to plant growth or toxic to animal life that feed on the plants.

Reclaimed land, even when graded to acceptable specifications, would probably have a large potential for high erosion and sediment yield. Compliance with environmental performance standard apparently can cause grading practices which could create elongated convex rounded slopes with long, uninterrupted surfaces available for overland flow. Assuming a worst-case situation, overburden material otherwise suitable for supplementing the limited topsoil, may also be highly erodible. A worst-case situation assumes limited availability of suitable topsoil for respreading over regraded overburden material. Depending on suitability of topsoil and overburden, reclamation would require extensive soil amendments and long-term management practices.

### Long Term Impacts

As a result of the changes in soil characteristics resulting from the proposed action, generally, long term productivity of the soils on the disturbed areas in the lease area would decline. Some of this decrease in productivity would result from accelerated erosion on denuded and disturbed areas. On marginally productive land, however, successful reclamation may result in a better land quality for plant growth than now exists. Thus after mining these lands can be returned to a desirable use. In this context, direct long term impacts to land resources, particularly on marginally productive areas, would be positive.

### Reclaimability

Two models for land reclamation were considered in the assessment: (1) returning post-mine land surfaces to gentler slopes, managed pasture, and subsequently abandoning management to permit natural succession to brushy and wooded lands, or (2) encouraging growth of native species to provide food and cover for wildlife. These are assessed separately in the following paragraphs.



The current practice for reclamation of surface mined lands in Texas is to unselectively mix topsoil and overburden and provide vegetative cover by sprigging with coastal bermuda grass. Growth is promoted by heavy fertilization. Pastures reclaimed in this manner are managed for hay production and/or rotation grazing. Weed growth is controlled by certain agricultural practices and/or by chemical applications. Commonly encountered problems include low organic matter, low fertility of overburden material, surface compaction and "acid spots" caused by unrecovered lignite stringers cast to the surface. Each of these problems may be overcome by appropriate soil amendments or agricultural practices.

At existing mine operations on the Gulf coastal plain, previous land use was mostly woodlot grazing or abandoned farmland (with or without grazing). In these cases, managed pasture constitutes a superior economic land use and is therefore an acceptable practice.

There is no reason to doubt that similar reclamation practices may be successfully implemented at Camp Swift. However, continued management as haylands or pasture is unlikely since prior experience has demonstrated grazing to be incompatible with military training at the Camp Swift site. Use by TANG is feasible with an "abandoned pasture" landscape.

Existing plant communities at Camp Swift are the result of invasion by pioneer species from abandoned farm land. Since acquisition of Camp Swift by DOA (early 1940s), "old field" succession has been interrupted by major influences except physical disturbance by personnel and vehicles during training exercises and by cattle grazing under a lease arrangement during the 1960s. Therefore, it is reasonable to expect that reclaimed pasture or hayland will revert to woodlands within approximately 30 years after management ceases. Species composition of such a second growth community would depend upon seed sources available (or provided).

The only advantage of the alternative reclamation is for replacement of wildlife habitat. This model consists of initial surface restoration and establishment of vegetative cover by the conventional practices as described above. After the surface is protected from soil erosion by this cover, establishment of native woody species, valued as wildlife cover and food, would be encouraged. Such practices have not been attempted at operating lignite mines in Texas. However, conservation practices have been developed by the Soil Conservation Service (SCS) and by the Forest Service of the U.S. Department of Agriculture for application on abandoned farm lands, severely eroded areas, and "waste" lands.

It is reasonable to expect that similar conservation practices would be successful on mined lands after the surface is initially stabilized using proven conventional means. The success potential of such practices would be

improved by utilization of nursery stock grown from native seed sources, by fertilization, by mulching, and/or by planting native seeds using a seed drill and non-till farming practices. Restocking with loblolly pine and other invasive woody species would be more readily accomplished than restocking with oaks and certain other prime wildlife food species.

Reclamation problems inherent to existing soils and overburden material at Camp Swift do not preclude successful reclamation. However, appropriate management practices and soil amendments described in the worst case analysis may be required.

## Recommendations

### *Monitoring and Data Collection Program*

In order to develop corrective measures and meet the environmental performance standards of PL 95-87, specific information on the following work elements would be necessary:

1. Collect representative field samples from key soils and analyze them for major physical and chemical parameters.
2. Collect representative overburden and lignite samples from selected continuous cores and analyze them for major physical and chemical properties.
3. Determine and describe revegetation and reforestation procedures and practices including soil amendments, types, and seeding methods.
4. Determine and describe techniques, schedule, equipment and costs for each phase of reclamation operation.
5. Test and compare suitability of mixed overburden and topsoil as a medium of plant growth in the greenhouse and/or on-site test plots.
6. Open test pits and determine recharge rates, rainfall-runoff relations and soil erosion loss rates from various simulated surface slope conditions of anticipated final soil cover and compare them with those of the existing soils.

Knowledge of the physical and chemical properties of overburden (including that of surface soil layers) is necessary to provide information for predicting revegetation potential, erosion potential, toxicity potential, water conductivity, physical stability, and for long term management decisions. Particularly, analysis of potential alkalinity of the overburden is necessary to determine in advance, if the proposed operation would involve materials which provide sufficient buffering capacity to neutralize or mitigate acid or toxic drainage.

The physico-chemical characterization of overburden, along with that of the surface soils, should be initiated by the lessee very early in the mine planning stage. This would aid in assessing the capability of the overburden as a substrate for revegetation and post-mining land use

and in determining whether disturbance of the overburden would result in water quality or soil quality degradation due to the presence of any toxic materials released to the environment.

The above mentioned information along with the results of field and laboratory studies from soils, biology and hydrology tasks would be necessary to provide a basis for a reclamation plan and to develop a strategy for the erosion control and other soil and water management practices for the proposed mine area.

#### Unavoidable Adverse Impacts

If special erosion control measures are not followed accelerated soil erosion would occur during the short term.

#### Irreversible and Irrecoverable Commitment of Resources

There would be an irretrievable loss of topsoils to sedimentation basins from initial clearing through final revegetation stages. No irreversible impacts to the soils or reclamation potential of the proposed lease area are projected.

#### Air Quality

##### Assumptions and Analysis Guidelines

The air quality impacts of the proposed leasing action were assessed using the results of atmospheric dispersion modeling of pollutants. The EPA-approved CDM and RAM computer models were used to predict annual and 24-hour concentrations of suspended particulate emissions resulting from mining operations. Surface mining activities generate significant quantities of suspended particulate matter and relatively small amounts of gaseous pollutants. Thus, only the air quality effects of particulate matter were analyzed in detail.

The two basic model input parameters are meteorological inputs and emission rates. The annual dispersion model used the frequency distribution of wind speeds, wind directions and stabilities obtained at the Austin, Texas municipal airport for the years 1959 through 1968. Figure 3-1 shows the distribution of wind speeds and directions that were used in the annual modeling. The short term, 24-hour, modeling used actual worst-case dispersion conditions determined from the National Weather Service data. During the worst-case period modeled, the average meteorological conditions were a wind speed of approximately 3.5 meters per second (7.8 mph) generally from the south-southeast, and neutral atmospheric stability.

Mine emissions were quantified utilizing information from the mining profile presented in Chapter One. When necessary data were not available, assumptions were used in order to quantify the emissions.

The haul road for the truck transportation option was assumed to be unpaved and extended across FM Road 2336, approximately 2.5 kilometers from the intersection of Highway 95 and FM Road 2336. The mine access road was assumed to be paved and located off Highway 290, approximately 3.5 kilometers northwest of McDade. Mining activities for year fifteen of lignite production were assumed to be located near the center of the proposed lease area.

Emission controls that are considered best available control technology (BACT) were assumed in the modeling. Haul roads were assumed to be regularly watered, resulting in a 50 percent control efficiency. Conveyors were assumed to be covered, resulting in a 90 percent reduction in emissions. Transfer points were assumed to be enclosed and vented to a baghouse or its equivalent, yielding a 90 percent control efficiency.

The total projected off-site particulate concentrations for each transportation option, including estimated background levels, were compared to the annual and 24-hour National Ambient Air Quality Standards (NAAQS). The projected increase in off-site particulate concentrations were compared to the annual and 24-hour Prevention of Significant Deterioration (PSD) increments.

Fugitive dust generated by TANG maneuvers was excluded from the analysis because of the variable area of activity and intermittent nature of operations.

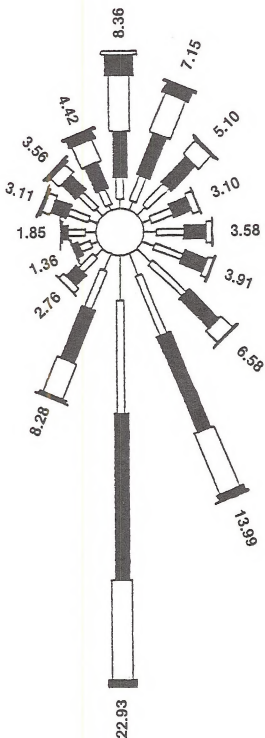
##### Standards and Regulations

The National Ambient Air Quality Standards prescribe pollutant levels which are not to be exceeded for specified averaging times. The primary NAAQS were established to protect human health, while the secondary NAAQS were established to prevent other adverse effects of air pollution. The annual and 24-hour primary NAAQS for particulate matter are 75 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) and 260  $\mu\text{g}/\text{m}^3$ , respectively. The respective secondary annual and 24-hour NAAQS are 60  $\mu\text{g}/\text{m}^3$  and 150  $\mu\text{g}/\text{m}^3$ .

The Prevention of Significant Deterioration (PSD) regulations established maximum allowable increases of suspended particulate matter in various class areas where the NAAQS are met. The proposed lease area is located in a PSD Class II area in which the allowable annual and 24-hour increments are 19  $\mu\text{g}/\text{m}^3$  and 37  $\mu\text{g}/\text{m}^3$ , respectively. There are no PSD Class I or Class II areas near the proposed lease area.

Current PSD regulations exempt fugitive dust from inclusion in total emissions in the determination of PSD applicability. Though not certain, the revised regulations are expected to include the same fugitive dust exemption when finalized. If fugitive dust is not considered, the PSD regulations would not be applicable to the proposed

# AUSTIN, TEXAS 1959 - 1968



## STABILITY CLASS FREQUENCY (%)

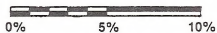
A = 0.9  
 B = 5.7  
 C = 11.9  
 DD = 23.9  
 DN = 25.7  
 E + F = 31.9

% CALMS - 4.46

## WIND SPEED (KNOTS)



LT 3  
 3 - 6  
 6 - 10  
 10 - 16  
 16 - 21  
 GT 21



C116

FIGURE 3-1

lease action. Under state air quality regulations, the mining development may be required to employ best available control technology (BACT) and best management or good mining practices for the mitigation of pollution emissions.

#### Short Term Impacts

Annual suspended particulate matter concentration of  $15 \mu\text{g}/\text{m}^3$  or greater were calculated at distances of up to one kilometer from the haul road for the truck transportation option (see Figure 3-2a). These impact levels are greater than 75 percent of the annual PSD increment ( $19 \mu\text{g}/\text{m}^3$ ). When added to background levels, total concentrations exceed 75 percent of the annual secondary NAAQS. If proposed revisions to the PSD regulations do not exempt fugitive emissions, mitigating measures may be necessary in order to reduce the haul road emissions sufficiently to avoid threatening the PSD increment.

Fugitive dust, as defined by current regulations, includes all mining activity emissions except those resulting from the handling of lignite. If the proposed revised regulations do not exclude these emissions from air quality assessments, the PSD increment may be threatened as mining moves near the site boundaries. Restrictions limiting the proximity of mining to the site boundaries may need to be implemented to mitigate these impacts.

Twenty four-hour concentrations calculated along the haul road were estimated to exceed the secondary NAAQS of  $150 \mu\text{g}/\text{m}^3$  and the 24-hour PSD increment of  $37 \mu\text{g}/\text{m}^3$  (see Figure 3-2b). These concentrations could be reduced to below 75 percent of the regulatory limits by paving the haul road or imposing a 20 mile per hour speed limit.

During those years that mining activities, and their resultant particulate emissions, are centered within a certain distance of the site boundaries, the secondary 24-hour NAAQS and the PSD increment may be exceeded in areas outside the lease area (see Figure 3-2c and d). More detailed analysis by the lessee could define this "buffer zone" with precision.

#### Unavoidable Adverse Impacts

Mining activities would increase concentrations of suspended particulate matter near the proposed facility throughout the life of the mine. After completion of mining, concentrations would revert to background levels.

#### Irreversible and Irretrievable Commitment of Resources

Implementation of the proposed action would result in degradation of the air quality near the proposed facility. Suspended particulate matter concentrations would increase and may exceed applicable standards and in-

crements. The degradation of air quality would be irreversible throughout the mining period, but concentrations would return to background levels upon completion of mining.

#### Hydrology: Groundwater

##### Assumptions and Analysis Guidelines

The following assumptions and guidelines directed the identification and analysis of significant environmental consequences affecting the groundwater resources near Camp Swift:

1. The proposed lease area overlies the outcrop of the Wilcox Group, the most important water-bearing rock unit in Bastrop County (Follett 1970).
2. Area strip mining may affect groundwater quantity and quality, as documented in studies of several coal-mining regions in the United States.
3. The proposed action would comply with final regulations issued by the Office of Surface Mining (OSM) that pertain to protection of the hydrologic balance.
4. Based on information gained during scoping, citizens of Bastrop County consider groundwater resources an important environmental component (information at BLM/NMSO).
5. Deep pressure relief wells are a possible but not an exclusive method of controlling possible large uplift pressures that may be encountered in the excavation.
6. Unknown factors, such as site-specific aquifer characteristics and detailed mining plans, will increase hydrogeologic impacts.

#### Short Term Impacts

Short term hydrogeologic impacts are concurrent with mining operations and involve changes in the quantity of water contained in the aquifer systems. In the Camp Swift lease area, aquifers in the Simsboro Sand and the Calvert Bluff Formation are most likely to be affected by the mining. The following reveals a potential impact to the local groundwater supply.

#### Groundwater Control

Groundwater conditions would vary considerably as mining proceeds across the proposed lease area. Two types of conditions would necessitate groundwater control.

The first condition is water percolation into the mine from stratigraphic units, particularly sands, that are exposed in the highwall. This water would drain into the excavation by gravity flow; and the amount of water would depend on the lignite seam depth and composition of exposed stratigraphic units. Estimates of discharge amounts are discussed below.

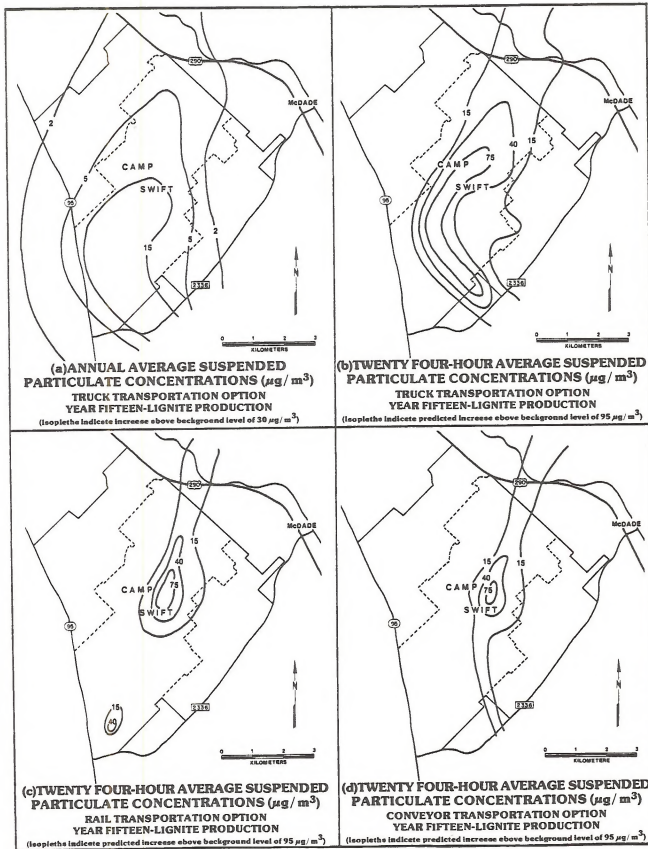


FIGURE 3-2

The other principal source of groundwater resulting from mining operations is aquifers, primarily the Simsboro Sand, underlying the proposed lease area. Water in the Simsboro Sand is under artesian pressure (water levels measured in wells in the aquifer rise above the top of the aquifer in response to hydrostatic pressure in the aquifer). As the excavation deepens and the overburden is removed, the hydrostatic pressure in localized areas of the Simsboro Sand may exceed the confining pressure of the sediments between the floor of the excavation and the top of the aquifer. As a result, uplift pressures on the floor of the excavation could cause heaving of the excavation floor or uncontrolled groundwater seepage through the pit floor. Because sand units containing artesian water are known to directly underlie a large area of recoverable lignite at Camp Swift, the impacts of a simplified artesian pressure relief system have been evaluated.

#### *Highwall Seepage*

The groundwater influx would depend on two factors: (1) the permeability of the overburden near the mine walls and (2) the depth of the mine excavation below the original water table, which determines the hydraulic gradient near the mine walls. Assuming (1) a high or worst case permeability of 1.0 meters per day (25 gallons per day per square foot) for strata exposed in the highwall, and (2) an average distance of 15 meters (50 feet) from the initial water table to the excavation floor, the average estimated rate of flow into the excavation from the highwall is 10 liters/sec (l/s) [160 gallons per minute (gpm)]. This amount is probably a high estimate because much of the exposed stratigraphic section is impervious clays and clayey silts that are relatively impermeable to water movement through them. However, localized zones of sand may contribute temporarily to higher rates of groundwater flow into the excavation. Assumptions and calculations used in this assessment are provided in Appendix 4.

#### *Depressurization*

Relief of excessive hydrostatic pressures in an aquifer may be accomplished by several techniques. At the proposed lease area, deep relief wells are probably the most effective method of depressurizing the Simsboro Sand under the excavation. However, the purpose of this section is only to identify and assess the potential impact of depressurization, not specify or recommend a particular method of groundwater control. Assumptions and calculations used in the following analysis are outlined in Appendix 4.

The pumping rate to reduce hydrostatic pressures in the Simsboro Sand is estimated to allow mining of lignite at a maximum depth of 61 meters (200 feet). Lower pumping rates would be satisfactory where mining is shallower. The estimated pumping rate is therefore an absolute maximum value, which would apply only when

mining occurs in the deepest part of the proposed mine area. This deep excavation scenario for the maximum pumping rate enables worst case impacts to be identified and evaluated.

Depressurization calculations were based on a linearly-arranged network of partially penetrating wells parallel to the excavation, which is similar to a method proposed by Wilson and others (1979). Total groundwater withdrawals under this scheme would be approximately 1500 l/s (24,000 gpm). This value results from a worst-case analysis, using high estimates of aquifer thickness and transmissivity, and assuming a very deep excavation. It is unlikely that this combination of variables would be simultaneously encountered during the proposed activity; nevertheless, this high estimate of groundwater withdrawal is useful in identifying the uppermost limit of pumping.

#### *Cone of Depression in Simsboro Sand*

Withdrawal of large amounts of groundwater from the Simsboro Sand would create a lowering of water levels (cones of depression) radially away from the excavation. Water level decreases are predicted from theoretical considerations due to a lack of site-specific data; the complex Simsboro aquifer system is described in simplified terms to permit an estimate of future water levels. Potential water level declines in the Simsboro Sand may be better assessed after pumping tests planned by the U.S. Geological Survey are completed. Estimates of water level declines are based on worst case high pumping rates from the previous depressurization analysis and therefore also reflect a worst-case condition. Drawdown calculations are based on 90 days of pumping, since most of the total drawdown would occur during this time. Additional drawdown would occur, but at a decreasing rate with increasing time. Table 3-2 presents the calculated theoretical water level decline at selected distances from a pressure relief well.

If water levels in the Simsboro Sand decline by the amount suggested by the theoretical values in Table 3-2, then nearby wells could be affected. Table 3-3 lists water wells adjacent to and downwind from the proposed lease area and indicates the amount of additional drawdown that could occur in each well.

Comparison of anticipated drawdowns due to mining (Table 3-2) and "available" drawdowns in local municipal and industrial wells (Table 3-3) indicates that mine dewatering operations would not greatly affect local water wells, even under worst-case conditions. Most wells are further than 3.2 km (2 miles) from planned active mine excavations. It is likely, however, that pumping costs for nearby groundwater users would increase if water levels dropped significantly. Impacts of dewatering operations would be temporary, and maximum effects would occur late in the mine operations.

**TABLE 3-2<sup>a</sup>**  
**THEORETICAL DISTANCE VS. DRAWDOWN**  
**FOR PRESSURE RELIEF SYSTEM**

| Distance In Kilometers From Center<br>of Excavation | Drawdown In Meters After 90 Days<br>of Pumping |
|---|--|
| 0.8 (0.5 miles)                                     | 39.4 (129 feet)                                |
| 1.6 (1 mile)  | 31.7 (104 feet)                                |
| 3.2 (2 miles)                                       | 24.4 (80 feet)                                 |

<sup>a</sup>Calculations and assumptions provided in Appendix 4.

**TABLE 3-3**  
**AVAILABLE DRAWDOWN IN SELECTED CAMP SWIFT AREA WELLS<sup>a</sup>**

| Texas Well No. | Owner             | Depth of Well<br>(Meters) | Height of Water<br>Above Top of<br>Screen (Meters) | Maximum<br>Drawdown Due<br>to Pumping <sub>0</sub> of<br>Well (Meters) | "Available"<br>Drawdown (Dis-<br>tance From<br>Pumping Level to<br>Top of Screen<br>(Meters) |
|----------------|-------------------|---------------------------|--|--|--|
| AT-58-54-201   | TX. Rendering Co. | 111                       | 65   | 1  | 64   |
| AT-58-54-202   | "                 | 101.6                     | 79   | 1.5  | 77.5   |
| AT-58-54-301   | "                 | 200                       | 68   | 24.7   | 43.3   |
| AT-58-54-501   | City of Bastrop   | 178                       | 41   | 9.5  | 31.5   |
| AT-58-54-502   | "                 | 162                       | 58   | 13.4   | 44.6   |
| AT-58-54-503   | "                 | 170                       | 50   | 12.8   | 37.2   |
| AT-58-54-504   | "                 | 163                       | 42   | 8.8  | 33.2   |
| AT-58-54-505   | "                 | 168                       | 40   | 7.9  | 32.1   |
| AT-58-54-506   | "                 | 180                       | 43   | 20   | 23   |
| AT-58-54-507   | "                 | 205                       | 48   | 15.8   | 42.2   |

<sup>a</sup>Tabulated from well data available in Follett (1970).

<sup>b</sup>Based on maximum pumping rates obtained from wells.

Note: 1 meter = 3.28 feet

Deep industrial or municipal wells near the proposed mine would probably not be greatly affected. Shallow domestic wells completed in the Calvert Bluff Formation near the mine area could be dewatered. In such cases, the provisions of the OSM Permanent Regulatory Program (30 CFR 816.54), which call for the replacement of disrupted water supplies, would apply. These impacts could be considered significant due to the potential for dewatering of local aquifers and a slight decrease in groundwater supply.

#### Long Term Impacts

Long term impacts (those occurring beyond the expected life span of the mine) are physical changes in the hydraulic properties of aquifers and water quality changes in the aquifer systems. This analysis reveals a significant threat to groundwater quality.

#### Physical Changes in Aquifers

The most significant potential impacts on the physical properties of aquifers resulting from area strip mining are changes in porosity, permeability, and groundwater storage characteristics. The Calvert Bluff aquifers are most likely to be affected, since the lignite seams to be mined are in that formation. The Simsboro aquifer is below the deepest lignite bed, and its physical characteristics would not be affected by mining.

When the overburden is stripped from the lignite seams and replaced in the immediate area, it is overturned and mixed in the process. Most of the lignite beds are in the saturated zone of the Calvert Bluff, so the overburden is likely to contain sandy, aquiferous strata. The mixing of these aquifers with the more predominant clayey and silty strata of the overburden could result in the loss of porosity and permeability, despite the fact that the post-mining water table level would likely return to the approximate pre-mining level. Also, if the infiltration characteristics of the overburden are changed drastically, the groundwater recharge potential of the area affected by mining could be reduced.

Several factors mitigate the seriousness of these impacts:

1. The pre-mining properties of the Calvert Bluff aquifers are relatively poor.
2. The overall density of the overburden will be initially reduced and porosity would be increased by the "loosening" effect of overturning.
3. The Calvert Bluff aquifers are not presently greatly valued as a major source of water supply, due to the presence of the much better Simsboro aquifer beneath the Calvert Bluff.

The most productive aquiferous strata in the Calvert Bluff have maximum hydraulic conductivities of only about 1 meter/day (25 gal/day/ft<sup>2</sup>). The post-mining hydraulic conductivity of the Calvert Bluff is not likely to be significantly lower than this low value. Studies at the Big Brown strip mines in Freestone County indicate a post-mining Calvert Bluff hydraulic conductivity range of 2.2 meters/day (55 gal/day/ft<sup>2</sup>) to 9.1 x 10<sup>-2</sup> meters/day (2.5 gal/day/ft<sup>2</sup>) (French 1979). Studies by Mathewson and others (1979) suggest that mining reduces hydraulic conductivity in most Calvert Bluff-type aquifers. Impacts to groundwater recharge overall are not considered to be significant.

#### Water Quality Changes

The potential for deterioration of groundwater quality caused by the proposed lease action depends on several factors. Some contaminants can enter groundwater systems during mining, but a more important potential source of contamination is the overburden that remains in the mined-out area as mining proceeds.

Because the mining would take place in the Calvert Bluff Formation, the Calvert Bluff aquifers would be most directly affected. The quality of the groundwater in the overburden would be the most degraded. Aquiferous strata in the Calvert Bluff that are not mixed and that are in the proximity of the mined-out area are also likely to be affected. The portion of the Simsboro aquifer underlying the mine area could also be affected by degraded recharge if hydraulic heads are lowered by dewatering.

*Overburden.* Water infiltrating the spoil generally would be degraded in quality as it moves through the geohydrologic system. This degradation would be extremely variable from place to place, and the variation cannot be adequately described without a large amount of data. It is reasonable to expect that the concentration of contaminants in groundwater would be greatest in the overburden material, which is where the contaminants would be released. Thus, the groundwater quality within the overburden would be affected more than groundwater elsewhere in the substrate near the mine.

The most significant changes in the water quality observed at Texas lignite mines are increases in the concentrations of sulfate, chloride, and total dissolved solids (TDS) (Lentz 1975; French 1979). In addition, concentrations of minor and trace elements (particularly iron, manganese, zinc, and nickel) would likely increase. The groundwater in the overburden would probably be unsuited for most uses after mining. Thus, it would not be advisable to drill shallow wells in the overburden. It should be noted that very few wells have been drilled in the Calvert Bluff in recent years. Nevertheless, the shallow groundwater resource in the area of any mine would be contaminated after mining is completed. This impact is considered significant due to the potential for degradation of groundwater quality.



*Calvert Bluff Aquifers.* Under post-mining conditions, contaminated groundwater, which is generated in the overburden, would not be restricted to the overburden. It would probably flow into the adjoining unmined Calvert Bluff strata. If the water table is reestablished to pre-mining levels as is expected, the groundwater flow patterns would be changed in the overburden because of probable changes in permeability caused by mining. The flow patterns in unmined portions of the Calvert Bluff near the mine would not be greatly changed. After groundwater leaves the overburden, it would follow approximately the same patterns as in natural conditions. Groundwater flow would be most rapid in the sand channels of the Calvert Bluff that act as groundwater "conduits".

Many of the contaminants introduced into groundwater in the overburden would be removed or eliminated by natural attenuation processes before the groundwater migrates a significant distance from the mine. The slow rate of groundwater movement in the Calvert Bluff would minimize the effect of the contaminated water in these time periods. However, groundstrata. For an aquifer such as the Calvert Bluff, the rate of movement probably does not exceed 1.5 meters (5 feet) per year, and is probably on the order of 0.3 meter (1 foot) per year. At a rate of 1.5 meters (5 feet) per year, contaminants would be transported only 152 meters (500 feet) from the mine site in a century. Dispersion would significantly reduce the concentration in the contaminated water on adjoining Calvert Bluff aquiferous water flow and the spread of contaminants are potentially ten times faster in sandy strata than in the Calvert Bluff as a whole. The extent of contamination would be greater in these zones.

*Simsboro Aquifer.* There is probably some groundwater flow downward and across bedding in the Calvert Bluff Formation (see Chapter Two, Hydrology). Some of this flow eventually reaches the Simsboro Sand as recharge water. Contaminated groundwater flowing from the lignite mine or overburden could eventually contribute to recharge water of the Simsboro. This contaminated recharge water moving into the Simsboro would then reduce Simsboro water quality, resulting in an impact of potentially high significance.

Several factors could reduce the impact of the mine on Simsboro water quality. The rate of groundwater flow across bedding is generally much slower than the rate of flow parallel to bedding in the Calvert Bluff. Also, silt and clay in the Calvert Bluff Formation should act to reduce the concentration of certain trace elements in the mine drainage water. In those areas where a mine encounters a sand unit in the Calvert Bluff, and this same sand unit is in direct hydrologic connection with the Simsboro, these factors would not be present. Such sand units are rare in the proposed lease area (see Map 2-1).

If contaminated groundwater enters the Simsboro down-gradient from the mine, the polluted water would be confined to a relatively small plume. The Simsboro receives a fraction of recharge from the Calvert Bluff. This fraction is unknown, but is probably relatively small in comparison to the recharge received directly by the Simsboro in the outcrop area. Thus, contaminated groundwater that might enter the Simsboro from the mine would not be a significant part of the recharge. The contamination should be restricted to a small, linear plume that would remain near the top of the Simsboro and would be dispersed gradually downward into the Simsboro.

## Recommendations

Measures designed to control or reduce the impacts of groundwater control techniques would probably be unnecessary. These impacts, the production of large quantities of groundwater and the resultant widespread decline of groundwater levels, would be temporary and would be significant for a relatively short time. Conditions similar to premining conditions would be eventually reestablished. Practices designed to limit or reduce the impacts resulting from groundwater control would probably be uneconomical at this time. An example of a groundwater control measure used successfully on projects of a much smaller scale is the construction of groundwater flow barriers, such as grout curtains or injection well fields, which are designed to impede or redirect groundwater flow.

## Physical Changes in Aquifers

Because physical changes in aquifers would not be an adverse impact, no recommendations are made. It is unlikely that effective measures could be employed in the reclamation plan. Such measures would probably involve the careful segregation and reconstruction of the pre-mining strata.

## Water Quality Changes

Measures designed to reduce deterioration of water quality are currently included in the OSM Permanent Regulatory Program. Such measures may vary for different portions of the proposed lease area because of changes in overburden and lignite geochemistry. Standard preventative measures include the segregation of toxic- or acid-forming materials and application of lime to neutralize acid-mine drainage.

If deterioration of water quality threatens off-site underground water supplies, these supplies would have to be replaced in accordance with 30 CFR 816.54.

## Unavoidable Adverse Impacts

Drawdown caused by pumping could deplete aquifers on a local extent and affect water available from nearby wells in the short term. Shallow groundwater resources in the area of the mine would be contaminated after mining is completed.

## Irreversible and Irretrievable Commitments of Resources

### *Physical Changes to Aquifers*

Changes in the physical properties of aquifers are irreversible, and affected materials would continue to change after reclamation ceases. These additional changes primarily involve compaction, resaturation, and weathering. The amount of aquifer material directly affected by the proposed action would be equal to the volume of overburden removed to mine the lignite.

### *Water Quality Changes*

Because groundwater is difficult to cleanse once it is degraded, groundwater quality changes may be viewed as an irreversible commitment of resources. As previously discussed, the volume of groundwater likely to be affected is small. Although Calvert Bluff aquifers near the mine boundary may experience significant but localized deterioration of water quality, it is unlikely that the important groundwater resource of the Simsboro Sand would experience severe water quality problems.

## Hydrology: Surface Water

### Assumptions and Analysis Guidelines

The following assumptions and guidelines directed the identification and analysis of significant environmental consequences affecting the surface water resources near Camp Swift:

1. According to information gained during scoping, citizens of Bastrop County consider surface water an important environmental component (on file at BLM/NMSO).
2. Changes to the existing environment resulting in violations of federal or state water quality standards are considered significant impacts.
3. Mining operations would be conducted as outlined in the proposed action.
4. Requirements of all state and federal regulations would be met.

## Short Term Impacts

### Quantity

Streamflow patterns of Big Sandy Creek, McLaughlin Creek, and Dogwood Creek would be significantly affected by the proposed project. The significant impact would be increased volume during the mine life. Summertime low flows and average annual discharges would probably increase noticeably in each stream, mainly as a result of added discharge from the relief wells. Taking into account that some of the water from the relief wells [0.04 cubic meters per second ( $m^3/sec$ )] would be used on site, estimated average flow increases total 1.57  $m^3/sec$  [55.82 cubic feet per second (cfs)] as summarized in Table 3-4.

The flow from the relief wells depends on the depth of the mine, and the above value would probably apply to the latter years of mining. In the earlier years, the total flow increase should be slightly less than the value of 1.57  $m^3/sec$  (55 cfs).

The locations of sedimentation ponds and discharges from pressure relief wells would vary in time, depending on the operating pit location. Discharges from these sources may take place into McLaughlin Creek, Dogwood Creek, or Big Sandy Creek, but flow would eventually go to Big Sandy Creek and then to the Colorado River.

The effects of increased flows on the receiving streams would be higher base flows, increased stream erosion, increased carrying capacity for sediment, and increased flow for potential downstream water use. Alterations could also occur in the aquatic habitat.

The base flow of Big Sandy Creek has been estimated to be less than 0.028  $m^3/sec$  (1.0 cfs) (see Chapter Two, Hydrology). Excluding the incremental increase in surface runoff of 0.1  $m^3/sec$  (3.6 cfs) (surface runoff does not contribute to base flow) the estimated base flow increase in Big Sandy Creek would be 1.47  $m^3/sec$  (52.5 cfs). This increased flow could be valuable for downstream uses (e.g., irrigation, stock watering, or recreation).

The median flow (the flow which is exceeded 50 percent of the time) has been estimated at less than 0.14  $m^3/sec$  (5.0 cfs) in Big Sandy Creek. The projected total average flow increase of 1.57  $m^3/sec$  (56.1 cfs) would increase the median flow to an estimated 1.71  $m^3/sec$  (61.1 cfs). This increase in median flow of more than ten times may result in some additional stream channel erosion. Higher velocities and depths of flow would increase the erosion of the banks of Big Sandy Creek. The higher flows would also cause an increased carrying capacity for sediment delivery to the Colorado River.

**TABLE 3-4**  
**ESTIMATED AVERAGE FLOW INCREASES**

| Source of Flow Increase | Volume                |                        | Reference  |
|-------------------------|-----------------------|------------------------|------------|
|                         | (m <sup>3</sup> /sec) | (ft <sup>3</sup> /sec) |            |
| Pressure relief wells   | 1.50                  | 53.0                   | Section 2  |
| Pit seepage             | 0.01                  | 0.35                   | Section 2  |
| Domestic wastewater     | <0.01                 | <0.35                  | Appendix 4 |
| Increase in runoff      | 0.1                   | 3.53                   | Appendix 4 |
| Consumptive use         | <u>-0.04</u>          | <u>-1.41</u>           | Chapter 1  |
| <b>Total</b>            | <b>1.57</b>           | <b>55.82</b>           |            |

The increased flow in Big Sandy Creek would initially increase sediment load and turbidity due to bottom scour. This change would decrease light penetration, lowering primary productivity and decreasing available benthic habitats. The increased streamflow would also destroy existing fish breeding and nesting areas. As the stream ecosystem adjusts to the new flow regime there would be an initial drop in both species diversity and abundance. This would be followed by a shift in species to those adapted to the higher flow conditions; resulting in a new balance which would persist for the duration of the flow. However, these effects of increased flow may be completely overshadowed by the effects of naturally occurring variation in the system, i.e. flood flows. When mining discharges cease, new sediments would be deposited and the creek would gradually return to pre-mining conditions.

When compared to the 25-year flood flow of 378 m<sup>3</sup>/sec (13,500 cfs), the flow increase of 1.57 m<sup>3</sup>/sec (56.1 cfs) would not significantly affect floodwater elevations.

To prevent runoff from entering the mine area (and then requiring treatment), streams above the mine area would probably be rerouted. These channels must be designed according to OSM regulations, which should minimize impacts (OSM 1978). "Mining will not cause substantial threat of loss to people or property, and to the natural and beneficial values of the floodplains on the lease tract and downstream, if the mined area is restored by reclamation to the general topography now existing" (Yost, 1980).

#### Quality

OSM regulations require all runoff and seepage from the mine area (up to the volume of the 10-year, 24-hour storm) to be captured and treated by sedimentation ponds prior to discharge (OSM 1978). The OSM regulations limit suspended solids to an average concentration of 35 mg/l (OSM 1978). This concentration is 35 percent of the flow-weighted average concentration estimated for this area under present conditions. Therefore, with sedimentation ponds designed according to regulations, the proposed action may result in lower concentrations of suspended solids than presently occur. During storms greater than the 10-year, 24-hour storm, an impact of a very short duration involving an increase in suspended solids would probably occur, since sedimentation ponds are not required to be designed for such storm events. At such a time, regulations on water quality could be temporarily exceeded.

Runoff and seepage from spoil banks during mining would probably cause increased levels of Total Dissolved Solids (TDS) (Radian, Yegua Mine 1977). The USGS is presently performing leachate tests from which the TDS level at the Camp Swift lease area can be calculated (USGS, Water Resources Division 1979).

However, significant dilution would be caused by the large volume of water being pumped from relief wells (see flows from Table 3-4 above). This water would contain a lower concentration of TDS since it will be pumped from the Simsboro aquifer, presently used as a drinking water supply. The well water would effectively dilute the runoff and seepage TDS levels, making the runoff and seepage equal to the well water quality. The dilution ratio would be 14:1.

Treatment of mine discharges for pH, iron, and manganese is required by OSM regulations; impacts from these pollutants would be mitigated by the regulations - therefore, surface water quality should not be significantly affected.

#### Long Term Impacts

OSM reclamation regulations require the disturbed area to be returned to the approximate original contour (OSM 1978). Reclamation would also restore vegetation and ground cover. These measures would result in the hydrologic balance and sediment delivery returning to approximate pre-mining conditions. Therefore, there would be no long term impact to surface water in the lease area.

Any erosion of the stream channel of Big Sandy Creek as a result of increased flows would be a long term impact. However, after mining had ceased and flows returned to pre-mining conditions, the erosion would slow to existing rates, and the channel would tend to stabilize.

#### Unavoidable Adverse Impacts

The increased stream flow and resulting channel erosion are impacts that may be unavoidable. Although alternative discharge locations could be investigated, discharge into Big Sandy Creek is likely to be the only feasible alternative.

#### Irreversible and Irrecoverable Commitment of Resources

There are no irreversible and irretrievable commitments of resources relevant to surface-water hydrology.

#### Land Use

##### Assumptions and Analysis Guidelines

Land use impacts within Camp Swift would be confined to military operations of the Texas National Guard. These impacts would be within the confines of the lease area, according to lease stipulations required by the Department of the Army (DOA) or regulations such as the Surface Mining Control and Reclamation Act (SM-CRA) (see Chapter One).

## Short Term Impacts

Mining as a result of the proposed action would create a short term impact exceeding the VRM Class IV standard. Since vegetation and topography make the entire area to be mined virtually inaccessible visually, the impact is almost entirely internal to the site. Along FM 2336 and short sections of State Highway 95, the mining would be clearly visible. Most of the viewing would be from moving automobiles, allowing only a brief look at mining.

At any particular location, the length of time between vegetation clearing and replanting after soil regrading would be approximately one year. For the open areas it would be slightly less because surface clearing is much less involved than with forested land. The contrast would be reduced to acceptable levels upon regrading of the backfill. Successful revegetation of the open meadow areas would be relatively quick and the visual contrast to unmined conditions would be negligible.

Some danger to mine workers, especially heavy equipment operators, could exist because of unexploded ordnance remaining in the lease area.

## Long Term Impacts

An impact of uncertain but at least moderate significance could result if the lignite were transported by rail. In that case, an off-site rail loop would be needed to provide a loadout area for a 133-car unit train. Because the DOA has stipulated a 60 hectare (150 acre) limit for mine ancillary and support facilities, the approximately 200 hectare (500 acre) loop would have to be constructed somewhere off-site next to both the lease area and a suitable railroad. The "loop tract" would contain rail loop, coal pile, and loadout facilities. Its impact would exist throughout the mine life (30.5 years). Mining in the area other than Camp Swift could extend the period of its impact.

## Recommendations

The approximately 200 hectare (500 acre) tract needed for the off-site rail loop could be used for purposes in addition to coal handling. Open portions not needed for coal piles, loadout facilities, and the like could be used for agriculture or other "open uses."

To eliminate dangers from unexploded ordnance, the lessee could conduct a survey of the lease area prior to mining. Current technology for metal detection would be an appropriate method for the survey. Tree clearing would be done before topsoil stripping begins for each mining unit. A metal detection survey of each mining unit could logically be done at that time.

## Unavoidable Adverse Impacts

The proposed action or larger area alternative could result in an unavoidable adverse impact to land uses on and next to the rail loop tract. Lease stipulations cannot be applied to it, and both the State of Texas and Bastrop County have very limited control over land uses in unincorporated areas. Coal handling activities could conflict with sensitive land uses such as residential and recreational if those uses happened to be near the chosen loop site. (Other transportation impacts are not projected to be significant; they are summarized in the background material available at LBM/NMSO and the six information centers). They are summarized in the background material available at BLM/NMSO and the six information centers).

## Irreversible and Irrecoverable Commitment of Resources

The dedication of land for the rail loop could be an irretrievable commitment of resources, assuming that the rail loop will have continued on after the life of the Camp Swift mine.

## Social and Economic Environment

Two major socioeconomic issues have developed in response to the proposed action. One of these is the pro-growth/no growth controversy among Bastrop County residents. The other issue has arisen because the proposed lease area would be exempt from all local taxes. These two issues, the growth controversy and the fiscal impacts controversy, are addressed in the remainder of this section. (Impacts to population and county infrastructure are not predicted to be significant in the context of overall regional growth. Regional growth is discussed under Cumulative Impacts at the end of this chapter; a discussion of other site-specific and economic impacts can be found in the background material.)

## Assumptions and Analysis Guidelines

An assumption which guided analysis of social and economic impacts was that the employee quantities, schedules, and related characteristics of the proposed action and alternatives would be accurate as presented in Chapter One. It was further assumed that no local or state government controls or actions (e.g., growth management, income maintenance) different from those currently in force would change during the project period.

One other important assumption was that close to two-thirds of the in-migrating work force associated with the proposed action would choose to reside in Austin, a feature that reduces impacts to the small area social infrastructure in Bastrop County.

## Short Term Impacts

Because the lease applicants for the Camp Swift property are public entities, they are exempt from local taxes. The federally-owned Camp Swift land itself is exempt from local taxes. Bastrop County would not be able to receive direct tax benefits from lignite development as a result of leasing Camp Swift lands.

Short term impacts center on the attitudes expressed by local residents and county officials, who are concerned primarily about the lack of tax or royalty revenues as a result of the proposed action. These persons are also somewhat concerned that the mine action may have adverse impacts on the local economy.

The general feeling is that the county is entitled to some compensation for extraction of the Bastrop County lignite underlying the Camp Swift site. The county judge has expressed interest concerning payment in lieu of taxes, (Griesenbeck, 1980).

Some Bastrop County residents may also oppose indirect effects of area wage increases (\$2.4 million payroll influx) such as the potential for slightly increased commodity prices, rents, and home prices. Since Bastrop County is a somewhat depressed area containing many elderly people on fixed incomes who could be affected by general growth pressures and rent and price increases, the lack of royalty payments or direct tax benefits could intensify local opposition to mining at Camp Swift. However, overall regional growth, with or without Camp Swift leasing, is projected to be significant (see Cumulative Impacts at the end of this chapter).

Potential problems to communities impacted by mineral development on federal land have led to development of specific legislation to channel royalty funds from production on federal land back to the impacted communities. The Federal Coal Leasing Amendments Act of 1976 (FCLAA) (P.L. 94-377) requires a mine operator to pay to the Department of the Interior a minimum royalty of 12.5 percent on the value of surface-mined coal. Half of these monies are then distributed to the impacted state to be:

"used by such State and its subdivisions as the legislature of the State may direct giving priority to those subdivisions of the State socially or economically impacted by development of minerals leased under this Act for (1)planning, (2)construction and maintenance of public facilities, and(3)provision of public services" (Sec. 9a).

However, research by the Bureau of Land Management staff suggests that these royalty funds would not be available in the Camp Swift case. The Camp Swift property is "acquired" federal land under the

provisions of the Mineral Leasing Act for Acquired Lands of 1947 and is exempt from the royalty provisions outlined in the Federal Coal Leasing Amendments Act of 1976. Thus, a number of legal obstacles may limit Bastrop County's obtaining financial compensation from resource extraction at the Camp Swift site.

## Long Term Impacts

Under worst-case conditions, Bastrop County would not receive direct economic benefits during the 35-year duration of the project. Federal royalty funds would be unavailable, and the power authority operating the mining operation would not make payments to the county in lieu of taxes. Although impacts upon roads, schools, and community services as a result of the proposed action are projected to be small to moderate, they would have to be funded by local taxing revenues. Local residents have recently experienced school district and county tax increases. They would likely oppose additional taxes to pay for services and improvements related to the proposed action.

It is difficult to assess the long term attitudinal response of local residents. However, research in other mining areas of the U.S. suggest that surface mining generates social and political conflict among local residents (Gold 1974; Krebs 1975; Bultena 1979). Any large scale surface mining in Bastrop County would probably lead to conflicts between residents who cherish the present environment in the county and those seeking change. Those opposing surface mining would stress the disruptions and ecological damage wrought by surface mining; those favoring surface mining would discount the environmental costs and stress the wage-related economic benefits. Local community leaders would be concerned with obtaining compensation for the resource extraction that benefits areas outside of the county.

## Unavoidable Adverse Impacts

Bastrop County would not receive direct economic benefits for leasing and development of Camp Swift.

## Noise

### Assumptions and Analysis Guidelines

Assessment of noise impacts from mining activities resulting from the leasing action (compared against existing background noise levels) was based on the following criteria:

- Levels of noise associated with mining activity.
- EPA's criteria for protection of human health and welfare from noise exposure.
- Sensitive receptors\* potentially exposed to mining-related noise.
- Increase in noise levels over existing ambient sound levels.

\*Sensitive receptors are humans and animals that have a low tolerance to noise.

It is assumed that mining operations would occur up to 30 meters (100 feet) of the lease area boundary and that all mining equipment for a worst case analysis would be operating in the same area continuously during a 24-hour period.

#### *Mining Operations Noise*

The level of noise associated with mining the Camp Swift lease area is directly related to the composition of mining equipment and periods of operation. The following assumptions were made to determine potential impacts: the equipment listed in Table 3-5 would be used in the mine area, noise levels would pertain at 30 meters (100 feet), and calculated noise levels would be at distance intervals to 610 meters (2,000 feet).

#### *Transportation Noise*

The method and route for transporting lignite from the mine to point of consumption is unknown, though three models were presented in Chapter One. The degree of noise impact would depend directly upon the chosen mode of transportation (rail, truck, conveyor) and the relationship of the route to human receptors. The highest noise levels would occur from rail transport, followed by truck haulage and conveyor transport. Additional trains along any existing route would increase the frequency of noise impacts.

Additional transportation noise of workers would not be appreciable. Minor percent increases on the major transportation routes could occur.

#### *Human Response to Noise*

An EPA "criteria document" was used as a basis for assessing potential reaction of humans to noise generated by mining. The graph in Figure 3-2 was developed from the EPA criteria.

Using the assumption that the major sources of noise (dragline, truck, scraper) are operating simultaneously in the same area on a 24-hour basis, an estimate was made of the worst-case day-night sound level ( $L_{dn}$ ) from mining. Impact calculations are presented in Appendix 6.

#### *Sensitive Receptors*

From this analysis, a 66 and 56 decibel ( $L_{dn}$ ) band at a distance of 305 meters (1,000 feet) and 610 meters (2,000 feet), respectively, was roughly imposed around the boundary of the lease area to obtain an indication whether nearby residents or areas of other human habitation could be affected. This portrayal is considered a worst-case for mining noise (see Map 3-1).

#### *Short Term Impacts*

Five residences and one church would experience noise levels in excess of 65 dB (Map 3-1) and would conceivably be impacted by noise levels approaching an  $L_{dn}$  of 70 dB. These levels could elicit reactions from inhabitants of these dwellings from "widespread complaints and threats of legal action" to "vigorous community reaction" (see Table 3-1).

The length of time any one receptor would experience these levels of noise would depend upon the rate of mining near the lease area boundary. The time period could range from a few weeks to a few months; during this period, mining noise would be perceived by the affected receptors as mildly to extremely annoying.

Sensitive receptors that would be exposed to noise levels in excess of 60 dB are the church and The University of Texas Cancer Research Center. Noise from mining within 610 meters (2,000 feet) of the church and cemetery could conceivably be very disruptive to worship services and burial services.

The staff at the Research Center have indicated that excessive noise adversely affects the behavior of chimpanzees. The chimpanzees are located in outside areas that would be impacted by noise approaching 65 dB. Exact physiological and psychological impacts of this level of noise on chimpanzees is unknown.

Other animals at the Research Center, cattle and swine, are known to readily adapt to high levels of noise.

The degree of impact upon the research staff is unknown, but it could be presumed that noise would be a distractive influence upon activities requiring mental concentration.

#### *Recommendations*

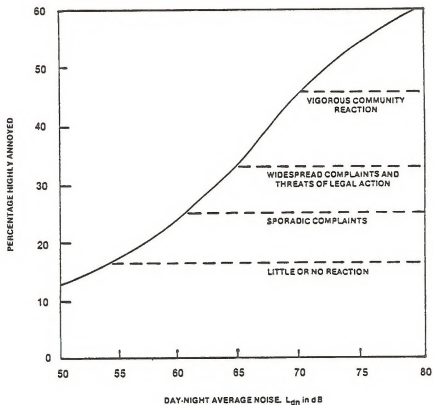
Should the plan require mining within 610 meters (2,000) feet of the lease boundary, noise impacts could be mitigated by using noise reduction devices on the principal noise sources. These include using muffling devices on machinery and enclosing the more prominent noise generators on the operating equipment. Use of the spoil pile as a berm between the active mining equipment and the receptors should be evaluated as a means to reduce noise levels to less than 55 dBA.

#### *Unavoidable Adverse Impacts*

In the short term receptors living near the Camp Swift base area boundary will be exposed to noise levels exceeding 55 dBA.

#### *Irreversible and Irretrievable Commitment of Resources*

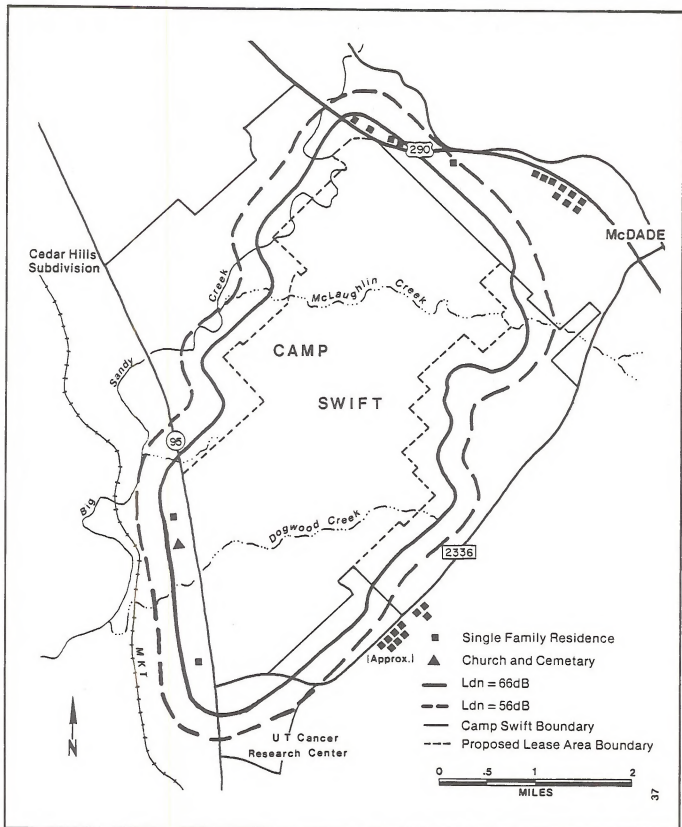
There are no irreversible or irretrievable commitments of resources associated with the generation of noise.



02-6050-1

**FIGURE 3-3**  
**EXPECTED COMMUNITY RESPONSE TO VARIOUS LEVELS OF NOISE**  
**Source: EPA 1974**





**TABLE 3-5**  
**EQUIPMENT INVENTORY WITH NOISE LEVELS**  
**ASSUMED AT DISTANCE INTERVALS**

| Equipment Item         | Sound Level - dBA* at  |            |            |            |
|------------------------|------------------------|------------|------------|------------|
|                        | 30 meters <sup>1</sup> | 182 meters | 305 meters | 610 meters |
| Dragline               | 74                     | 58         | 54         | 48         |
| Front End Loaders      | 68                     | 52         | 48         | 42         |
| 10-Ton Truck           | 70                     | 54         | 50         | 44         |
| 100-Ton Truck (12 mph) | 75                     | 59         | 55         | 49         |
| 100-Ton Truck (20 mph) | 72                     | 56         | 52         | 46         |
| Tractor                | 72                     | 56         | 52         | 46         |
| Water Wagon            | 70                     | 54         | 50         | 44         |
| Scraper                | 74                     | 58         | 54         | 48         |

\*Assumes Standard Field Equations.

<sup>1</sup>Source levels at 30 meters (100 feet) were obtained from Reference.

Note: 1 meter = 3.28 feet

## LARGER AREA ALTERNATIVE

Under this alternative, the application for leasing of Camp Swift lignite would include all the lease area proposed for the preferred alternative (proposed action), plus (1) the 34 hectares (85 acres) presently containing the University of Texas System lease 23 hectares (56 acres) for a Cancer Research Center, (2) two hectares (four acres) in the three cemeteries, and (3) six hectares (15 acres) containing FM 2336 and the required 30-meter (100-foot) buffer zone. An additional 2.4 million metric tons (2.7 million short tons) of lignite would be made available for generation of electricity.

Impacts of the larger area alternative would be proportionately the same as those from the proposed action.

A significant adverse land use impact of the larger area alternative would be the temporary removal of 23 hectares (56 acres) of land on the north side of the U.T. System Cancer Center used for grazing test animals. This would probably occur between years 15 and 30 of the project. Usage of this tract of land by the Center would be directly disrupted for up to 8 years under the larger area alternative. The present U.T. System lease expires in December 1984, before mining would occur; however, the lease is renewable under its present terms (see Land Use section of Chapter Two).

Surrounding lands which might be substituted for this tract for grazing purposes are privately owned; their availability for acquisition or lease is limited, according to officials at the Center. Moreover, adjacent private lands would not necessarily serve the same uses in terms of the Center's pasture management program.

Theoretically, the disruption of the U.T. Center's use of the tract would be temporary, lasting for approximately eight years. That disruption, however, could lead to more permanent disruption of nearby ancillary activities.

For example, mining in the larger area alternative would cause an increase in noise levels at the U.T. Cancer Center. At this location, levels of noise would possibly approach 70 dB for a period of several weeks. The effects of this decibel level upon non-human primates is currently unknown; information is being sought from appropriate sources.

### Unavoidable Adverse Impacts

Adverse impacts determined to be unavoidable would be comparable to those described in the proposed action. There would be an additional loss of 2.4 million metric tons (2.7 million short tons) of lignite. Noise levels in the Center area would be higher because mining would occur at a closer proximity.

## Irreversible and Irrecoverable Commitment of Resources

An additional 2.4 million metric tons (2.7 million short tons) would be committed over that required in the proposed action.

## Recommendations

The lessee could provide an adjacent 23 hectares (56 acres) for use by the U.T. Cancer Center until the reclamation program returned the tract to a state usable for the Center's purposes. Success of this measure would be limited, since an adjacent tract would fail to serve all the same uses that the tract now serves.

The lessee could arrange with the U.S. Department of the Army for a tract of land somewhere on Camp Swift outside the lease area to be transferred to the U.T. System at the expense of the lessee. This tract should be essentially identical to the present 23-hectare (56 acre) site. Timing of this measure would be important to assure that this area was available prior to mining of the present Cancer Center tract. Success of the measure would depend on how agreeable the arrangements would be to the Cancer Center at some point 15 years into the project action. The expense of a complete relocation might not justify the value of the lignite resource which could be extracted from the 23 hectare (56 acre) tract.

## NO ACTION ALTERNATIVE

Under this alternative, the application to lease Camp Swift lignite would be rejected. Some 70 to 90 million metric tons (80 to 100 million short tons) of lignite would not be available for generation of electricity and an alternative source of fuel would have to be found. Camp Swift would continue to be used solely by TANG for military training. The natural resources of the reservation would continue to develop according to existing natural and land use constraints. Potential paleontological resources would remain inaccessible for study. The cultural resources would remain in their present condition subject to deterioration caused by natural erosive process and current land use. Existing trends in population and economic change would continue in Bastrop County (see the next section of this chapter, Cumulative Impacts, for a discussion of ongoing trends in the county). An estimated \$2.4 million annually would not be available to the county from mining payroll.

## CUMULATIVE IMPACTS

Impacts resulting from development of Camp Swift lignite and associated projects would represent a small component of the overall cumulative impacts occurring from energy developments in the lignite regions of Texas. This section presents a discussion of development trends and the more critical impact areas viewed from a cumulative perspective. It is organized to show first a broad overview of the growth trends associated with the type of energy projects planned for Camp Swift and secondly, the relative contribution of Camp Swift development to regional and (where possible) sub-regional development.

### Texas Lignite Development Forecast

Based upon demands for energy in the utility and industrial sectors and a recognized role assumed by coal and lignite in satisfying these demands, it has been widely accepted that a reasonable development scenario for Texas lignite is as projected in Table 3-6.

Interpreted in terms of production, development of Texas lignite is expected to increase from 18 million metric tons per year (mmt) (20 million short tons per year (msty)) in 1978 to about 180 mmt (200 msty) in the year 2000.

Planned coal and lignite power plants as of October 1978 are shown on Map 3-2. Also depicted are total estimated strippable lignite reserves in millions of tons by development regions associated with location of the lignite resource. It is forecast that development will occur by region in terms of coal and lignite utilization according to the schedule of Table 3-7.

From a statewide perspective, development of 90 million tons of lignite at Camp Swift represents about 1.3 percent of the total committed Texas lignite at year 2000. The Camp Swift resource is expected to support a utility power plant of about 500 MWe. This represents about 0.7 percent of the total planned coal and lignite utilization and about 1.2 percent of total lignite utilization in the state.

### Camp Swift Regional Development

As shown on Map 3-2, Camp Swift is interrelated with development activities in the North Central and Central Lignite Regions. Of the economically recoverable lignite in the two regions 2086 million metric tons (2300 million short tons) in the North Central and 544 million metric tons (600 million short tons) in the Central, the Camp Swift resource represents about 3 percent of the total. Assuming Camp Swift development will cause addition of another lignite fired power plant of 500 MWe capacity, the new plant would represent about 2.2 percent of the total coal and lignite end-use for the two regions.

For individual regions, Camp Swift represents 3.9 percent and 15 percent of recoverable lignite in the North Central and Central regions, respectively, and facility utilization of Camp Swift lignite represents 3.2 percent and 9.4 percent of the forecast levels in each region.

### Sub-Regional Development

To view development levels on a more local basis, a subregion consisting of Milam, Lee, Fayette, Bastrop and Caldwell Counties was considered. The illustration on Map 3-3 depicts existing and planned power plants and their relationship to potentially recoverable lignite. Table 3-8 lists approximate capacity of each power plant and dedicated lignite tonnage where applicable. The planned power plants listed in Table 3-8 will all be fired with lignite as a fuel. Sandow-4 is expected to become operational in 1981; both Fayette-3 and Texland power plants may become operational in the late 1980s.

The Camp Swift recoverable lignite resources represent about 25 percent of the total planned lignite sub-regional production through the late 1980s. Other plans may be initiated for additional development; these plans are unannounced at this time. The resource from Camp Swift development is expected to fuel a power plant of about 500 MWe; this represents about 20 percent of planned lignite utilization and about 11 percent of total power generation in the sub-region.

### Cumulative Environmental and Socioeconomic Impacts

Based upon the above statewide, regional and sub-regional development forecasts, an estimate of cumulative impacts for the more critical impact areas was performed. These impact areas are

1. Air Quality,
2. Solid Waste,
3. Water Quality,
4. Fish and Wildlife,
5. Social and Economic Conditions,

### Air Quality

Increased development and use of lignite in Texas would contribute directly to air pollutant loading through mining, combustion, gasification, and indirectly through urban growth resulting from economic activity in the lignite belt.

The major impact upon air quality from mining would be caused by an increase in particulates, consisting of lignite dust and soil. Most of the heavy particulate matter would settle within or near the mined area and would not contribute to a widescale cumulative impact. Fine particulates, conversely, may interact from one mine with another and cause an increase in particulate (cumulative) loading.

**TABLE 3-6  
POTENTIAL REQUIREMENTS FOR TEXAS LIGNITE COMMITMENT**

| Year | Lignite Commitment      |                        |
|------|-------------------------|------------------------|
|      | Millions of Metric Tons | Millions of Short Tons |
| 1978 | 726                     | 800                    |
| 1985 | 1450                    | 1600                   |
| 2000 | 5450                    | 6000                   |

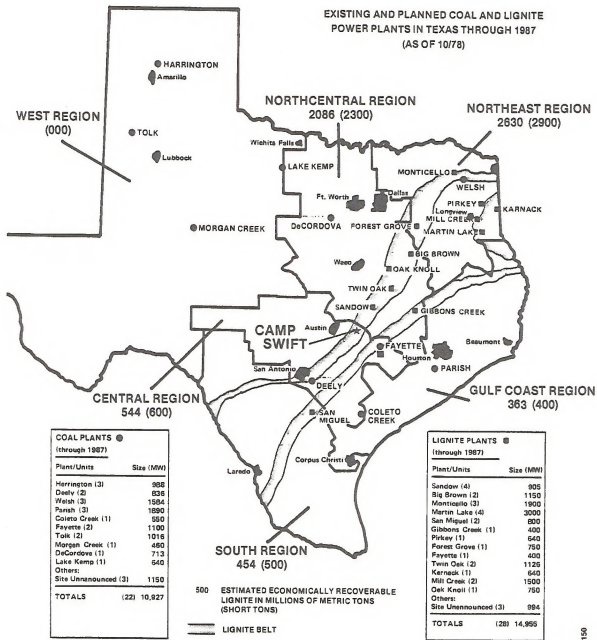
Source: Radian 1979.

**TABLE 3-7  
DISTRIBUTION OF HYPOTHETICAL 500 MWe COAL AND LIGNITE FACILITIES  
FOR YEARS 1985 AND 2000**

| Region        | Coal      |           |            |             | Lignite   |           |            |             | Total       |              |
|---------------|-----------|-----------|------------|-------------|-----------|-----------|------------|-------------|-------------|--------------|
|               | Utilities |           | Industrial |             | Utilities |           | Industrial |             | 1985        | 2000         |
|               | 1985      | 2000      | 1985       | 2000        | 1985      | 2000      | 1985       | 2000        |             |              |
| Northeast     | 2         | 6         | 0.1        | 0.7         | 10        | 32        | 0.5        | 5.3         | 12.6        | 44.0         |
| North Central | 2         | 4         | 0.2        | 1.3         | 7         | 20        | 2.0        | 6.2         | 11.2        | 31.5         |
| Central       | 2         | 7         | 0.0        | 0.2         | 1         | 3         | 0.0        | 0.4         | 3.0         | 10.6         |
| South         | 0         | 0         | 0.0        | 0.2         | 3         | 6         | 0.0        | 0.3         | 3.0         | 6.5          |
| Gulf Coast    | 4         | 12        | 1.5        | 11.2        | 0         | 1         | 0.5        | 8.7         | 6.0         | 32.9         |
| West          | 4         | 12        | 0.2        | 1.4         | 0         | 0         | 0.0        | 2.1         | 4.2         | 15.5         |
| <b>Total</b>  | <b>14</b> | <b>41</b> | <b>2.0</b> | <b>15.0</b> | <b>21</b> | <b>62</b> | <b>3.0</b> | <b>23.0</b> | <b>40.0</b> | <b>141.0</b> |

Source: Radian 1979.

EXISTING AND PLANNED COAL AND LIGNITE  
POWER PLANTS IN TEXAS THROUGH 1987  
(AS OF 10/78)



| COAL PLANTS ●<br>(through 1987) |                    |
|---------------------------------|--------------------|
| Plant/Units                     | Size (MW)          |
| Harrington (3)                  | 908                |
| Deely (2)                       | 636                |
| Welsh (3)                       | 1564               |
| Parish (3)                      | 1690               |
| Coletto Creek (1)               | 650                |
| Fayette (2)                     | 1100               |
| Tolk (2)                        | 1016               |
| Morgan Creek (1)                | 460                |
| DeCordova (1)                   | 713                |
| Lake Kemp (1)                   | 640                |
| Others:                         |                    |
| Site Unannounced (3)            | 1150               |
| <b>TOTALS</b>                   | <b>(22) 10,927</b> |

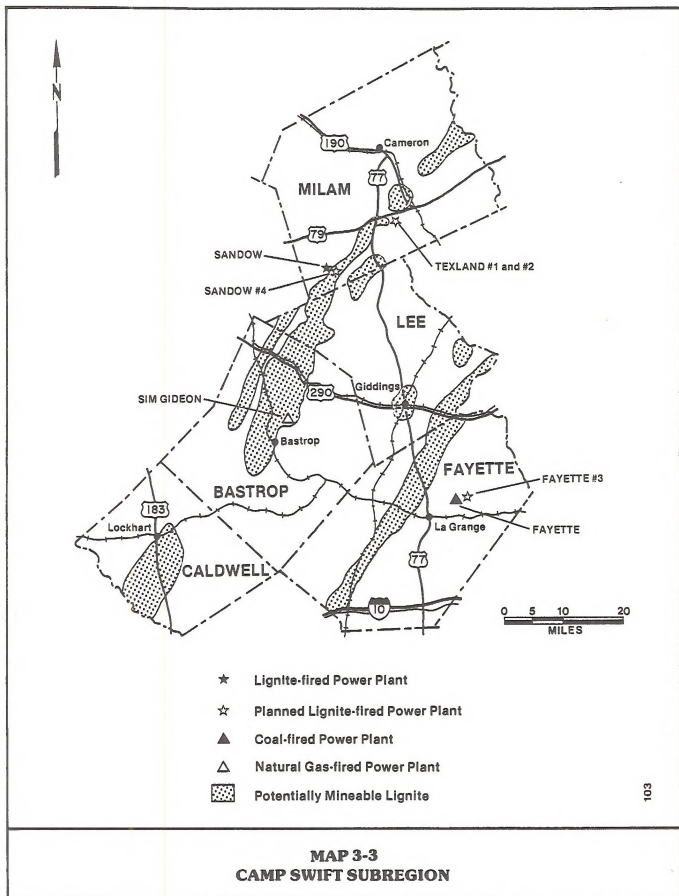
| LIGNITE PLANTS ■<br>(through 1987) |                    |
|------------------------------------|--------------------|
| Plant/Units                        | Size (MW)          |
| Sandow (4)                         | 905                |
| Big Brown (2)                      | 1150               |
| Monticello (3)                     | 1900               |
| Martin Lake (4)                    | 3000               |
| San Miguel (2)                     | 800                |
| Gibbons Creek (1)                  | 400                |
| Pirkey (1)                         | 640                |
| Forest Grove (1)                   | 750                |
| Fayette (1)                        | 400                |
| Twin Oak (2)                       | 1125               |
| Karnack (1)                        | 640                |
| Mill Creek (2)                     | 1500               |
| Oak Knoll (1)                      | 750                |
| Others:                            |                    |
| Site Unannounced (3)               | 994                |
| <b>TOTALS</b>                      | <b>(28) 14,995</b> |

500 ESTIMATED ECONOMICALLY RECOVERABLE  
LIGNITE IN MILLIONS OF METRIC TONS  
(SHORT TONS)

== LIGNITE BELT

C190

**MAP 3-2**  
**LIGNITE RESOURCE**  
**PLANNED UTILITY POWER PLANT CONSTRUCTION THROUGH YEAR 1987**  
**Source: RADIAN 1979**



**TABLE 3-8  
EXISTING AND PLANNED POWER PLANTS AND MINES  
IN THE CAMP SWIFT SUB-REGION**

| Power Plant   |           | Fuel        | Capacity (MWe) |             | Operator               | Mine Capacity *<br>(Million Tons) |            | Operator               |
|---------------|-----------|-------------|----------------|-------------|------------------------|-----------------------------------|------------|------------------------|
| Existing      | Planned   |             | Existing       | Planned     |                        | Existing                          | Planned    |                        |
| SANDOW        | --        | Lignite     | 330            | --          | TUSI                   | NA                                | --         | ALCOA                  |
| --            | SANDOW-4  | Lignite     | --             | 545         | TUSI                   | --                                | 76         | ALCOA                  |
| --            | Unnamed   | Lignite     | --             | 1500        | TEXLAND                | --                                | 210        | Unknown                |
| Sam Gideon    | --        | Natural Gas | 565            | --          | LCRA                   | NA                                | --         | --                     |
| Fayette       | --        | Coal        | 1200           | --          | LCRA/City<br>of Austin | NA                                | --         | --                     |
| --            | Fayette 3 | Lignite     | --             | 500         | LCRA/City<br>of Austin | --                                | 70         | LCRA/City<br>of Austin |
| <b>Totals</b> |           |             | <b>2095</b>    | <b>2545</b> |                        | <b>NA</b>                         | <b>356</b> |                        |

**TABLE 3-9  
AIR QUALITY POLLUTANTS GENERATED BY PLANNED UTILIZATION  
OF COAL AND LIGNITE IN THOUSANDS OF TONS PER YEAR**

| Air Quality Pollutant | Camp Swift Development | Statewide | Percent Camp Swift | North Central Region (NCR) | Percent Camp Swift | Central Region (CR) | Percent Camp Swift | Combined NCR & CR | Percent Camp Swift | Camp Swift Subregion | Percent Camp Swift |
|-----------------------|------------------------|-----------|--------------------|----------------------------|--------------------|---------------------|--------------------|-------------------|--------------------|----------------------|--------------------|
| SO <sub>2</sub>       | 7.1                    | 860       | 0.8                | 223                        | 3.2                | 75                  | 9.5                | 248               | 2.4                | 36                   | 20                 |
| NO <sub>x</sub>       | 9.2                    | 1300      | 0.7                | 300                        | 3.1                | 98                  | 9.4                | 398               | 2.3                | 47                   | 20                 |
| TSP                   | .5                     | 75        | 0.6                | 15                         | 3.3                | 4.9                 | 10                 | 90                | .5                 | 2.3                  | 22                 |

Pollutants calculated on basis of one 500 MWe producing 7,066 tons per year (TPY) of SO<sub>2</sub>, 9200 tpy of NO<sub>x</sub> and 460 tpy of TSP.  
Source: White and Wilson 1980.



Prevention of Significant Deterioration (PSD) regulations essentially preempt substantial accumulation (or cumulative) air quality impacts. In effect, these regulations impose a minimum spacing pattern for lignite end use facilities or other major sources of sulfur/dioxide (SO<sub>2</sub>) nitrogen oxides (NO<sub>x</sub>) and particulates (TSP). It was estimated that a minimum spacing of 20 kilometers (13 miles) would be required for 1500 MWe power plants to comply with the PSD regulations (Radian 1979).

Viewing the role of Camp Swift development as percentage of total air quality pollutant generation caused by coal and lignite development forecasts on a state, regional and sub-regional level reveals the relative magnitude of pollutant contribution by that project. Table 3-9 shows this relationship.

The table indicates that air pollutant contributions from utilization of Camp Swift lignite would comprise less than one percent of the total statewide development. For the Camp Swift sub-region, its development would represent about 20 percent of the total additional pollution load, a quantity which is a non-significant impact.

#### Solid Waste

Cumulative impacts from solid waste may be viewed in incremental increases in solid waste tonnage from each new development rather than an accruing impact at a particular area. Camp Swift development would contribute indirectly to the overall magnitude of solid waste on a regional scale in that the lignite would fuel a power plant which in turn would generate ash and sludge as wastes.

As an example of waste forecast to be generated by region and sub-region by the year 2000 and examining the relative contribution resulting from Camp Swift development consider the representative volumes tabulated in Table 3-10.

Land requirements for Camp Swift related solid waste as percentage of total land required for new lignite and coal energy developments range from less than one percent on a statewide basis to 20 percent required for the Camp Swift sub-region. Removal of 266 acres from land use other than solid waste disposal is considered a non-significant impact. Solid waste disposal can possibly contaminate groundwater; these impacts are not quantifiable. Contribution to the cumulative potential impacts from utilization of Camp Swift lignite is also unknown. However, regulations under the Resource Conservation and Recovery Act should preempt in most cases and minimize in others any appreciable degree of groundwater degradation.

#### Water Availability

The Central Texas region uses groundwater from the Carrizo-Wilcox aquifer and surface water from the Colorado Basin, which is managed exclusively by the Lower Colorado River Authority. Utilization of water resources is on a granted "rights" basis, awarded by the Texas Water Rights Commission. Water rights are prioritized by use in order of the following list:

1. Municipal supply;
2. Industry and manufacturing;
3. Irrigation;
4. Mining, oil and gas extraction;
5. Hydroelectric power, power plant cooling;
6. Navigation;
7. Recreation and pleasure.

The greatest consumptive use of water from one set of development assumptions through the year 2000 arises from power plant cooling (Radian 1980). A 500 MWe coal- lignite-fired power plant will typically consume on the order of 8.3 million liters (6700 acre-feet) per year for cooling and 1.1 million liters (900 acre-feet) per year for other uses. Lignite production from a mine to fuel a 500 MWe plant will require about 0.3 million liters (250 acre-feet) per year.

Water required by regional category with percentage of requirement from utilization of Camp Swift lignite is given in Table 3-11.

Consumption of water resulting from Camp Swift development represents about one percent of the statewide total and about 10 percent of the Central Region total supplies, respectively. Major impacts to surface water supplies caused by lignite and coal utilization are not evident on a cumulative basis.

#### Fish and Wildlife

Fish and wildlife would be impacted in the short term by disruption of habitat. Total statewide acreage that would be disturbed by lignite mining will approach 162,000 hectares (400,000 acres). Of this, the Camp Swift development represents about 1.0 percent (1620 hectares or 4000 acres). Though the cumulative size of total acreage seems large, the development would occur over some 40 to 50 years with reclamation following mining within a three to five year period.

The mining would occur in areas that are generally described as poor habitat quality indicating that ecosystems that would be affected by mining are already stressed (Tenrac 1979). Some planners believe that wildlife habitat can be substantially improved over

**TABLE 3-10**  
**SOLID WASTE GENERATION AND LAND REQUIREMENTS FOR YEAR 2000**

| <b>Regional Category</b>        | <b>Solid Waste Volume (Acre-Feet/Year)</b> | <b>Land Required* (Acres)</b> | <b>Percent of Total Volume From Camp Swift</b> | <b>Percent of Total Land From Camp Swift</b> |
|---------------------------------|--|-------------------------------|--|--|
| Statewide                       | 30,700                                     | 41,000                        | 0.87   | 0.65   |
| North Central Region            | 6,200                                      | 8,200                         | 4.3  | 3.2  |
| Central Region                  | 3,500                                      | 3,800                         | 7.6  | 7.0  |
| Camp Swift Subregion            | 1,350                                      | 1,350                         | 19.7   | 20.0   |
| 500 MW <sub>e</sub> Power Plant | 266  | 266                           | 100.0  | 100.0  |

\*Based upon 30-year life of plant with wastes disposed at an average of 30 feet deep.  
Source: Radian 1979.

**TABLE 3-11**  
**WATER REQUIREMENTS FOR UTILIZATION OF COAL AND LIGNITE FOR YEAR 2000**

| <b>Regional Category</b> | <b>Consumption, 10<sup>3</sup> Acre-Ft/ Yr</b> | <b>Supply, 10<sup>3</sup> Acre-Ft/ Yr</b> | <b>Percent of Supply</b> | <b>Camp Swift Percent of Supply</b> |
|--------------------------|--|---|--------------------------|-------------------------------------|
| Statewide                | 700  | 15,400                                    | 4.6                      | 1.1                                 |
| North Central            | 190  | 2,600                                     | 7.2                      | 4.0                                 |
| Central                  | 80   | 2,000                                     | 3.9                      | 9.5                                 |
| Camp Swift Subregional   | 39   | Unknown                                   | Unknown                  | Unknown                             |

Source: White and Wilson 1980

current conditions during the reclamation process (Tenrac 1979). Cumulative impacts to fish and wildlife are expected to be transient lasting up to five years after mining is completed. Some high quality habitat would be removed but the total quantity is small.

### Socioeconomic Impacts

The proposed mining of Camp Swift lignite, taken cumulatively with other mining and with assumed end uses in the region (see Map 3-4) noted on Table 3-12 could result in problematic socioeconomic consequences. Spacing of developments geographically and sequencing of their construction would be important factors in how serious their impacts would be. While it is not reasonable to expect that all the planned generating facilities indicated in Table 3-12 would be constructed by once, it is probable that most will be committed for construction by 2000. The more building activity that occurs at once, the more extensive growth impacts would be to nearby communities.

For now, forecasts indicate that Milam County will receive the largest energy-related growth with some 9000 employees associated with lignite development. It has a major portion of the sub-region's lignite resource, 737 million metric tons (813 million short tons), and has two mine-mouth power plants scheduled for construction during the next ten years. Impacts there are already being felt as demands for housing and community services have begun to stress available supply.

Lee County, while having no generating facilities planned for lignite or other fuel, has nevertheless experienced considerable leasing activity for use of its lignite, presumably at power plants in adjacent counties. In addition, there has been a recent flurry of new oil and gas activity around Giddings. Drilling crews and other oil field workers have placed a large demand on temporary housing, including hotels and motels, in that area.

Second to Milam County, the largest energy-related impacts would and are being experienced by communities in Fayette County. These impacts come as a result of the construction and operation of dual coal-fired power plants east of La Grange. A third unit is planned at the same site, but for burning of Texas lignite rather than Western coal. La Grange, Fayetteville, and other towns within commuting distance of the plant sites have undergone the usual variety of growth pressures during construction of the coal fired units (housing shortages, substandard mobile home developments in unincorporated areas, escalating rents, stress on public services/facilities). Reaction of local leaders has been mixed. They are, on one hand, pleased to receive new economic stimulus in areas that previously had been declining in jobs and population for decades. And yet, when such growth is too rapid and brings no direct royalties or tax benefits (i.e., the

developers are tax-exempt), they are often hard pressed to keep up with and pay for the costs of this growth.

Much of the construction related impact is now over, and Fayette County is settling back to a more routine level of activity. This type of situation, naturally, is easier to manage than the rapid influx experienced by the county a few years ago.

Caldwell County has a small amount of near-surface lignite, and no substantial leasing activity. Only the oil fields at Luling, in the southern end of the county, have provided any energy-related growth, none of which is recent.

Of the five counties included in the Camp Swift sub-region, Bastrop County contains the second largest deposit of wear-surface lignite, 405 million metric tons (447 million short tons). The estimated recoverable resource is 350 million metric tons (380 million short tons).

Impacts of lignite development in Bastrop County, taken with anticipated development in the adjacent counties, could become an issue if they stress area communities' ability to absorb growth (see Table 3-12). As already noted, geographic spacing of activities and sequencing of construction are critical factors in how significant the impacts become.

It does not appear likely that more than a single lignite-fired power plant will be constructed in Bastrop County in the foreseeable future. As mentioned in Chapter One, it is possible that such a plant will eventually be constructed beside the existing Gideon Station near Lake Bastrop. It is also reasonable to assume that Camp Swift lignite, if mined, would be burned there should a plant be constructed in a compatible time-frame. If so, the socioeconomic impacts of the mine work force of 230 would be magnified.

There is a strong likelihood that Bastrop County will experience lignite-related growth in the next 20 years whether the Camp Swift resource is mined or not. Because of the uncertainty with respect to placement and timing of other activities, it is not possible to predict with confidence if development at Camp Swift would add a critically significant increment of growth locally.

The rate of population growth for Bastrop County is expected to surpass that of several other "rural" Central Texas counties. This is due in part to satellite growth related to Austin, some 19 kilometers (30 miles) west of Camp Swift. If this growth, unrelated to lignite development, continues or accelerates, than an added increment resulting from mining Camp Swift and constructing a mine-mouth power plant at a critical point in time could create real socioeconomic problems. County, regional, and perhaps even state planning could help to avert such problems.

**TABLE 3-12**  
**ENERGY DEVELOPMENT RELATIVE TO POPULATION TRENDS**

| County        | Population    | Population Projections |                | Near-Surface<br>Lignite<br>Resource<br>(million tons) | Existing<br>Generating<br>Facilities | Planned                          | Cumulative<br>Estimated<br>Energy<br>Related<br>Workforce <sup>1</sup> |
|---------------|---------------|------------------------|----------------|---|--------------------------------------|----------------------------------|--|
|               | 1977          | 1985                   | 2000           |   |                                      |                                  |  |
| Bastrop       | 20,000        | 25,440                 | 33,300         | 447   | 1-540 MW<br>Natural Gas              | 1-540 MW<br>Lignite <sup>2</sup> | 3,096  |
| Milam         | 19,700        | 20,700                 | 21,900         | 813   | 1-360 MW<br>Lignite                  | 3-1640 MW<br>Lignite             | 9,040  |
| Lee           | 8,800         | 10,900                 | 12,400         | 183   | None                                 | None                             | --   |
| Fayette       | 17,600        | 17,800                 | 16,900         | 102   | 2-1100 MW<br>Western Coal            | 1-400 MW<br>Lignite              | 3,235  |
| Caldwell      | <u>22,100</u> | <u>22,300</u>          | <u>25,600</u>  | <u>76</u>   | <u>None</u>                          | <u>None</u>                      | <u>--</u>  |
| <b>Totals</b> | <b>88,200</b> | <b>97,140</b>          | <b>110,100</b> | <b>1,621</b>  | <b>4-2000</b>                        | <b>5-2580 MW</b>                 | <b>15,371</b>  |

<sup>1</sup>Assumes a peak construction workforce of 2,500 employees, an average surface mining workforce of 80 workers per million tons and 0.33 workers per MW of plant operation. A multiplier of 3.1 could be applied to the employment figures to determine the total population impact (in addition to projections shown in first three columns) which would result.

<sup>2</sup>Although no formal plans have been announced it is likely that a power plant will be build in Bastrop County fueled by lignite from within the county.

Sources: U.S. Department of Commerce, 1978.

Texas Department of Water Resources, 1978 (baseline projections made without regard to potential full development of lignite resources).

Kaiser, William R., 1974.

Radian Corporation, 1979.

## CHAPTER FOUR CONSULTATION AND COORDINATION

### THE SCOPING PROCESS

The Council on Environmental Quality (CEQ) regulations require an early and open scoping process (40 CFR 1501.7). This process identifies the scope of issues to be analyzed and significant issues related to the proposed action and alternatives. Information from the scoping process was one of the sources used to determine significant impacts to be addressed in detail in the DEIS. By emphasizing significant issues, the magnitude of paper work and the length of the statement have also been reduced.

Additional purposes of the scoping process were to inform affected federal, state and local agencies and other interested persons about the proposal and to identify existing environmental reports and information related to the proposal. Related consultation and review requirements were also identified and addressed in the DEIS (Chapter 1, Authorizing Actions).

The scoping process involved discussions with the public, resource specialists, and various government agencies.

#### Scoping Meetings

Regulations direct that the lead agency invite participation of affected federal, state and local agencies and other interested persons to join in the scoping process. Two public meetings and one interagency meeting were held. A summary of each meeting, attendance lists, written comments solicited during the meetings, and public announcements are on file with BLM/NMSO.

A brief summary of each meeting follows.

Public Meeting - July, 1979; Bastrop, TX

Sixty-five individuals attended. The purposes of the meeting were to (1) present the public with the proposed action and potential alternatives, as well as previously identified issues or problem areas; and (2) seek assistance in further defining the range of action, alternatives, impacts, and issues to be considered in the EIS. A list of issues raised by the public is in Appendix 7.

Interagency Meeting - July, 1979; Austin, TX

Twenty-five individuals attended. The purpose of this meeting was to solicit discussion and comment on the scope of the EIS from interested governmental agencies and environmental groups. The issues or comments

raised at the initial public meeting were also discussed. A list of agencies or group contacted for this meeting is attached in Appendix 7. No new issues were discussed, and very few questions or comments were raised.

Public Meeting - April, 1980; Bastrop, TX

Two sessions were held which were attended by 32 individuals. The purpose of this meeting was to inform the public and solicit discussion and comment on (1) the scope of the proposed action and alternatives; (2) the preliminary unsuitability assessment; and (3) the potential for impacts to 100-year floodplains. The government's contractor for the EIS, Radian Corporation, was introduced. Time frames for preparation of the EIS and proposed leasing were presented. Most comments were similar to those expressed at the previous public meeting. Concern for the public's health was expressed. Other comments pertained to opportunity for public involvement and provisions of the strip mining regulations.

#### Public Information Files

These files were arranged to provide the public with the opportunity to review material relating to the preparation of the EIS and the proposed leasing. News releases announcing the files were distributed and the files were discussed at the April 1980 meeting. Files were located at the University of Texas at Austin General Library, University of Texas at San Antonio Library, Bastrop Public Library, Smithville Public Library, Elgin City Hall, and the Texas Railroad Commission in Austin.

Included in the files were: pertinent government regulations and guidelines, schedules, summaries of the scoping process, and background information. Backup material for the DEIS (in the form of a Technical Reports Volume) has been added to those files for the public comment period.

#### AGENCIES CONSULTED

##### Federal

- Department of Agriculture, Soil Conservation Service
  - New Mexico State Office
  - Texas State Office
  - Austin Area Office
  - Bastrop County District Office
- Farmer's Home Administration
  - Texas State Office: Temple
- Agricultural Stabilization and Conservation Services
  - Texas State Office

- Department of the Army
  - Corps of Engineers, Fort Worth District
- Advisory Council on Historic Preservation and Texas State Historic Preservation Officer
- Environmental Protection Agency, Region VI
- Department of Housing and Urban Development
  - San Antonio Area Office
- Department of Commerce
  - Economic Development Administration
- Department of Health, Education, and Welfare
- General Services Administration
- Community Services Administration
  - Region VI Office
- Veterans Administration
  - Texas Regional Office
- Department of Justice
  - Bureau of Prisons
- Geological Survey
  - Topographic Division
  - Conservation Division
  - Geologic Division
  - Water Resources Division
- Heritage, Conservation, and Recreation Services
  - Albuquerque Regional Office
- Fish and Wildlife Service
  - Austin Area Office
  - Region VI Office
  - Region II Office
- Office of Surface Mining
  - Region IV Office
  - Tulsa District Office
- Bureau of Mines
- Department of Energy

## Texas

- Alamo Area Council of Governments
- Capital Area Planning Council
- Governor's Budget and Planning Office
- Texas Historical Commission
- Texas Department of Water Resources
- Texas Department of Community Affairs
- Texas Department of Highways and Public Transportation
- Texas Parks and Wildlife Department
- Texas State Soil and Water Conservation Board
- Texas Railroad Commission
  - Surface Mining and Reclamation Division
- University of Texas System
  - Cancer Research Center
  - Bureau of Economic Geology
  - Office of the General Council
- Texas Department of Health
- Texas Energy Advisory Council
- Texas Army National Guard
- Texas Air Control Board
- Texas General Land Office
- City of Austin

Comments on the draft environmental impact statement (DEIS) are being requested from the above agencies as well as the following:

## Federal

Department of Energy

Department of Housing and Urban Development

Department of Labor

Federal Energy Regulatory Committee

Federal Highway Administration

Federal Railroad Administration

Interstate Commerce Commission  
Mine Safety and Health Administration  
National Park Service  
Nuclear Regulatory Commission  
Water and Power Resources Service  
Water Resources Council

#### State

The Governor's Budget and Planning Office will coordinate comments from all interested Texas state agencies.

Comments on the DEIS are also being requested from local governments, nongovernment organizations and private individuals.

Copies of the DEIS may be obtained by contacting:

Carol A. MacDonald  
Bureau of Land Management  
P. O. Box 1449  
Santa Fe, New Mexico 87501  
Commercial phone: 505-988-6214  
FTS phone: 476-1214

Also, copies of the DEIS are available for review at the public information files listed earlier in this chapter.

This DEIS should be retained to be used in conjunction with the final environmental statement. The final statement will incorporate this document by reference and include the modifications and corrections which should be made to the draft as a result of public comment. The final statement will also include a record of public comments on this draft and the responses to those comments.

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**Association, soil** - A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single mapping unit.

**Aquifer** - A geologic formation which yields water in sufficient quantity to be used as a source of supply.

**Aquitard** - A geologic formation which yields inappreciable quantities of water compared to an aquifer.

**Artesian** - A condition such that groundwater is confined under pressure by overlying and underlying formations and water levels in wells rise above the top of the aquifer.

**Available water capacity (available moisture capacity)** - The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount of wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

|               | Inches      |
|---------------|-------------|
| Very low..... | 0 to 3      |
| Low.....      | 3 to 6      |
| Medium.....   | 6 to 9      |
| High.....     | More than 9 |

**Clay** - As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

**Core** - A cobble from which flakes have been removed.

**Debitage** - Residue from stone tool manufacturing process.

**Depositional environment** - A geographically restricted complex where a sediment is (or was in the geologic past) deposited, described in terms of physical, chemical, and biological conditions; e.g., a lake, swamp, or flood plain.

**Erosion** - The wearing away of the land surface by running water, wind, ice, or other geologic agents and by such processes as gravitational creep. **Erosion (geologic)** - Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion. **Erosion (accelerated)** - Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes a bare surface.

**Flakes** - Chips off a core.

**Flood hazard area** - Approximately equivalent to the 100-year floodplain; areas that would be inundated during a flood that has an annual probability of occurrence of 1 percent.

**Flow weighted average sediment concentration** - The concentration of sediments delivered to a body of water by more than one contributing stream. Calculated by the formula:

$$C = \frac{\sum c_i f_i}{\sum f_i}$$

where  $c_i$  = sed. conc in the contributing stream

$f_i$  = the flow of the contributing stream

**Hydraulic conductivity** - A measure of the ability of the aquifer to conduct water under the influence of a hydraulic gradient; see Permeability.

**Hydrologic soil groups** - Classes of soils based on their runoff potential from rainfall. Four major soil groups are used. The soils are classified on the basis of intake of water at the end of long-duration storms occurring after prior wetting and opportunity for swelling, and without the protective effects of vegetation.

**The major soils groups are:**

**A. Low runoff potential** - Soils having high infiltration rates even when thoroughly wetted. These consist chiefly of deep, well to excessively drained sands or gravels. These soils have a high rate of water transmission in that water readily passes through them.

**B. Soils having moderate infiltration rates when thoroughly wetted** - These consist chiefly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.

**C. Soils have slow infiltration rates when thoroughly wetted** - These consist chiefly of soils with a layer that impedes downward movement of water or soils with moderately fine to fine texture. These soils have a slow rate of water transmission.

**D. High runoff potential** - Soils having very slow infiltration rates when thoroughly wetted. These consist chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission.

**Interburden** - Barren rock material, typically in thin beds, occurring between or alternating with recoverable lignite beds.

**Intermittent stream - A.** A stream or reach of a stream that drains a watershed of at least one square mile, or **B.** A stream or reach of a stream that is below the local water table for at least some part of the year, and obtains its flow from both surface runoff and groundwater discharge.

**Lignite** - A brownish-black coal that is intermediate in coalification between peat and subbituminous coal; consolidated coal with a caloric value less than 8300 BTU/pound, on a moist, mineral-matter-free basis.

**Lignite reserves** - Known lignite deposits that are recoverable under present conditions but that are as yet undeveloped.

**Lignite resources** - The valuable lignite of an area that is presently recoverable or may be so in the future. Includes the lignite reserves, as yet undiscovered deposits, and known deposits for which recovery is not yet economically feasible.

**Liquid limit** - The moisture content at which the soil passes from a plastic to a liquid state.

**Loam** - Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

**Low strength** - Inadequate strength for supporting loads.

**Overburden** - Barren rock material, usually unconsolidated, overlaying a mineral deposit and which much be removed prior to mining.

**Paleobotany** - The study of the plant life of the geologic past.

**Percs slowly** - The slow movement of water through the soil adversely affecting the specified use.

**Perennial stream** - A stream or part of a stream that flows continuously during all of the calendar year as a result of groundwater discharge or surface runoff.

**Permeability** - The quality that enables the soil to transmit water or air, measured as the number of inches per hour that water moves through the soil. Terms describing permeability are very slow (less than 0.06 inch), slow (0.06 to 0.20 inch), moderately slow (0.2 to 0.6 inch), moderate (0.6 to 2.0 inches), moderately rapid (2.0 to 6.0 inches), rapid (6.0 to 20 inches), and very rapid (more than 20 inches); see Hydraulic conductivity.

**Phase, soil** - A subdivision of a soil series or other unit in the soil classification system based on differences in the soil that affect its management. A soil series, for example, may be divided into phases on the bases of differences in slope, stoniness, thickness, or some other characteristic that affects management. These differences are too small to justify separate series.

**Plasticity index** - The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

**Plastic limit** - The moisture content at which a soil changes from a semisolid to a plastic state.

**Potentiometric surface** - The surface that coincides with the hydrostatic pressure level of the water in the aquifer.

**Reaction, soil** - The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as:

|                             | pH             |
|-----------------------------|----------------|
| Extremely acid.....         | Below 4.5      |
| Very strongly acid.....     | 4.5 to 5.0     |
| Strongly acid.....          | 5.1 to 5.5     |
| Medium acid.....            | 5.6 to 6.0     |
| Slightly acid.....          | 6.1 to 6.5     |
| Neutral.....                | 6.6 to 7.3     |
| Mildly alkaline.....        | 7.4 to 7.8     |
| Moderately alkaline.....    | 7.9 to 8.4     |
| Strongly alkaline.....      | 8.5 to 9.0     |
| Very strongly alkaline..... | 9.1 and higher |

**Recharge zone** - An area where water is added to the aquifer by infiltration of a precipitation or streamflow.

**Series, soil** - A group of soils, formed from a particular type of parent material, having horizons that, except for the texture of the A or surface horizon, are similar in all profile characteristics and in arrangement in the soil profile. Among these characteristics are color, texture, structure, reaction, consistency, and mineralogical and chemical composition.

**Shrink-swell** - The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

**Silt** - As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, silt that is 80 percent or more silt and less than 12 percent clay.

**Site index** - A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

**Storage coefficient** - The volume of water that an aquifer releases from or takes into storage per unit surface area per unit change in hydraulic head.

**Stratum (pl. strata)** - A tabular or sheet-like mass, or a single and distinct layer, of homogenous or gradational sedimentary material (consolidated rock or unconsolidated earth) of any thickness, visually separable from other layers above and below by a discrete change in the character of the material deposited or by a sharp physical break in deposition, or by both; a sedimentary bed.

**Subsoil** - Technically, the B horizon; roughly, the part of the solum below plow depth.

**Surface soil** - The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer", or the "Ap horizon."

**Terrace** - An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it can soak into the soil or flow slowly to a prepared outlet without harm. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

**Tilth** - The condition of the soil in relation to the growth of plants, especially soil structure.

**Water table** - The upper surface in the zone of saturation of an unconfined aquifer.

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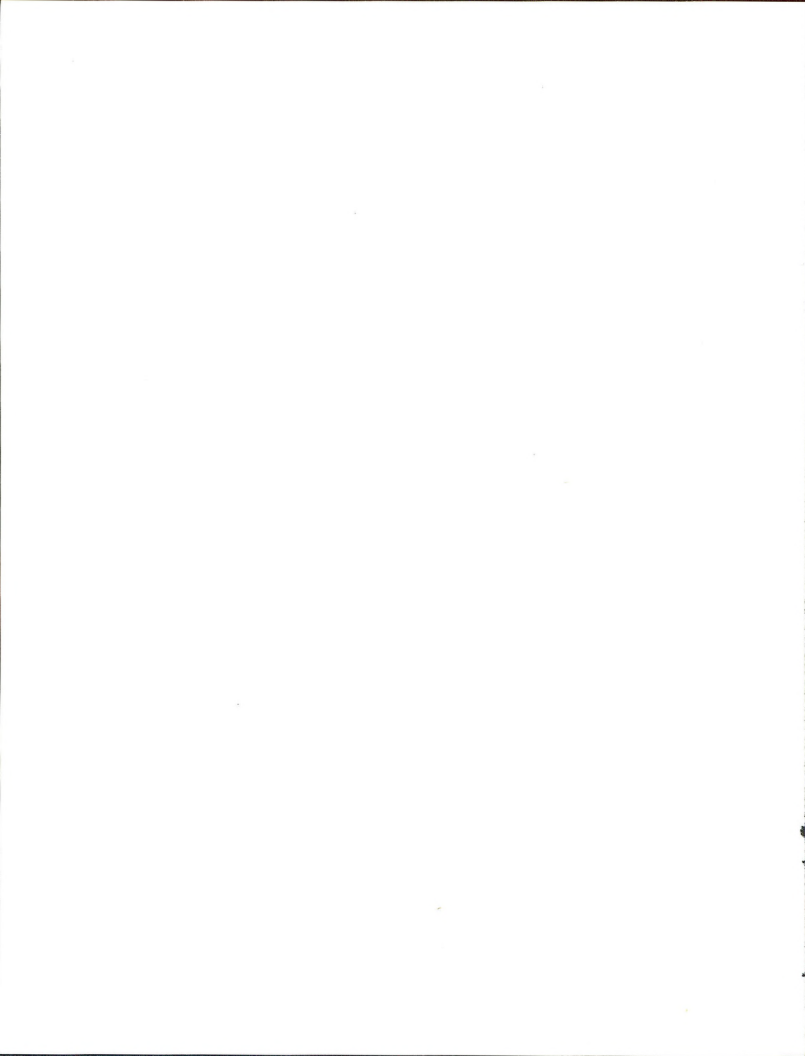
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APPENDIX 1

UNSUITABILITY ANALYSIS  
PREPARED BY BLM/NMSO



DRAFT UNSUITABILITY ASSESSMENT  
CAMP SWIFT MILITARY RESERVATION  
HARDSHIP COAL LEASE APPLICATION  
NM A-29640 TEXAS

Introduction

The Department of the Interior (DOI), Bureau of Land Management (BLM), with concurrence of the Department of the Army (DOA), has prepared this draft unsuitability assessment on the proposed leasing of lignite reserves underlying the Camp Swift Military Reservation in Bastrop County, Texas. The proposed leasing action was formulated in response to a hardship coal lease application (NM A-29640 Texas) for 6,740 acres of Camp Swift. The application was submitted to BLM in December 1976 by the Lower Colorado River Authority (LCRA) of Austin, Texas, with the City of Austin, Texas, as a joint applicant. A second coal lease application (NM A-29642 Texas) was also submitted to BLM in December 1976 by the San Antonio City Service Board.

The purpose of the unsuitability assessment is to identify those lands within Camp Swift, and particularly the lease application area, which are unsuitable for any or all methods of surface coal mining. This draft assessment is the first step in fulfilling the DOI's responsibility to review federal lands under Section 522(b) of the Surface Mining Control and Reclamation Act of 1977 (SMCRA). A final unsuitability assessment will be prepared after receipt of public comment on the draft Camp Swift environmental impact statement (EIS) which is scheduled for publication in September 1980.

Location

The Camp Swift Military Reservation is located in the central portion of the West Gulf Coastal Plain. It lies approximately 30 miles east of Austin, Texas, in the Colorado River drainage. The distance of the reservation from the river is approximately 5 miles. The location of the reservation is shown on Map 1.

Status of Surface and Mineral Estates

The 11,740-acre area which now constitutes the Camp Swift Military Reservation was acquired from private ownership in the early 1940's by DOA. The surface and subsurface resources of the reservation have been managed by DOA since that time. However, leasing of the lignite reserve is the responsibility of the DOI, under the authority of the Mineral Leasing Act of 1920, the Mineral Leasing Act for Acquired Lands of 1947, and the Federal Coal Leasing Amendments Act of 1976. There are presently no existing leases on the federal coal at Camp Swift.

At the request of BLM, the Office of the Field Solicitor (DOI) has begun a review of the titles of transfer which conveyed the 6,740-acre area contained in the lease application to DOA ownership. The results of this review are expected to be available by fall, 1980. The review is intended to establish the exact extent of federal interest in the surface and mineral estates and

to identify any encumbrances (such as rights-of-way or easements) to DOA's ownership. Under Texas law, a conveyance or reservation of the mineral estate, unless otherwise expressly stated, does not include surface or near-surface minerals which can be extracted only by stripping or pit mining (Acker v. Guinn, 464 S.W.2d 348, Tex. 1971). This rule has been applied to deposits of lignite (Reed v. Wylie, 554 S.W.2d 169, Tex. 1977). It is not expected that the Field Solicitor's review will identify any tracts for which the lignite reserves were specifically reserved to the original owners at the time the tracts were conveyed to DOA. However, if such reservations are identified, those areas would have to be excluded from the lease area (with appropriate buffer zones); a lessee could not mine the private lignite without obtaining rights to that lignite from the private owner.

It is possible that the Field Solicitor's review may identify rights-of-way or easements in addition to those discussed in this unsuitability assessment. If so, the unsuitability criteria will be applied to them in the final assessment. However, it is unlikely that such additional rights-of-way or easements would still be in active use; therefore, exception analysis will probably indicate that any such areas would be suitable for leasing.

In June 1980, ICRA submitted to BLM a complete survey of the lease application area, to aid in determining the status of surface and mineral ownership. Cadastral surveys of the area, used in both the titles of transfer and the lease application, are believed to contain inaccuracies which should be identified and corrected by the survey. The survey was performed for ICRA by an independent contractor and will be fully certifiable for BLM's needs.

#### Lignite Reserves

The lignite reserve which underlies the application area occurs in the Calvert Bluff Formation of the Lower Eocene Wilcox Group. Although the area is not currently within the boundaries of a Known Recoverable Coal Resource Area (KRCRA), the U.S. Geological Survey (USGS) is currently preparing a report to create a KRCRA to include the application area. (A KRCRA is an area which meets minimum standards for recoverable coal deposits in accordance with accepted mining practices. No federal land can be approved for lease unless it is included in a KRCRA).

The KRCRA for Camp Swift is scheduled for designation in January 1981. In the meantime, preliminary exploration data from ICRA indicates sufficient lignite reserves at Camp Swift to justify continued processing of the lease applications.

#### Methods and Procedures

This draft unsuitability assessment was prepared by BLM's New Mexico State Office (NMSO) according to the directions and requirements of 43 CFR 3461. Those regulations are appended as Attachment 1. In several instances, the NMSO requested and received from the BLM Washington Office of Coal Management (OCM) interpretations on the meaning of the regulations (and particularly on several of the criteria) as they might pertain to the lease application area. The memorandum received from OCM is appended as Attachment 1a.

This draft assessment represents an initial application of the 20 unsuitability criteria of 43 CFR 3461.1 (and exceptions) to the proposed lease area. It is a draft because there are a number of special problems and conditions which must be resolved before the results of the assessment can be conclusive. These special problems and conditions include:

- 1) Uncertainty over the status of portions of the proposed lease area. This information is expected to be available as a result of the Field Solicitor's review as discussed above.
- 2) Uncertainty concerning the precise acreage of the proposed lease area. Information will be provided by the survey submitted by ICRA as discussed above. The exact acreage will be determined after completion of the Field Solicitor's review.
- 3) The University of Texas System has not yet responded to a request for consent or denial to leasing. The University's Cancer Research Center has a 56-acre lease for miscellaneous purposes on the southern portion of the lease application area (see Criteria 2 and 6).

4) Some conditions which now make portions of the proposed lease area unsuitable may change before the Assistant Secretary of the Interior for Land and Water Resources decides whether to lease the area. Specifically, further consultation is needed to complete exception analysis on F.M. 2336 (Criterion 3), and DOA may relocate three small cemeteries which are currently unsuitable (Criterion 3).

The NMSO anticipates that the information necessary to resolve each of the problems listed above will be available by the close of the public comment period on the draft EIS. Therefore, the final unsuitability assessment will be prepared simultaneously with the final EIS, which is scheduled for December 1980 through March 1981.

When the assessment was prepared, all of the criteria were initially applied to the lease application area (Map 2). Then, the exceptions listed following each criterion were examined to determine which were applicable; areas presently considered unsuitable after consideration of exceptions are shown on Map 3.

#### Summary of Preliminary Determination

Based on the analysis of criteria and exceptions in this draft assessment, approximately 140 acres of the lease application area may be unsuitable for leasing (see Map 3):

- 1) Texas Utilities Fuel Company right-of-way for a buried natural gas pipeline (0.5 acre)
- 2) Three small cemeteries, including 100-foot buffer zones (4 acres)
- 3) Right-of-way for Farm-to-Market Road (FM) 2336, plus 100-foot buffer zone north of the road (15 acres)

4) The University of Texas System's Cancer Research Institute lease (85 acres)

5) A 100-foot buffer zone along Texas State Highway 95 (35 acres)

### Assessment

#### Criterion No. 1

Analysis: None of the listed land systems or categories is present on the lease application area.

Data Source: Various sources, such as Corps of Engineers, Department of the Army, USGS 15° Topographic Maps (Lexington, Bastrop, Smithville, Elgin Quadrangles).

#### Criterion No. 2

Analysis: The DOA (through the Corps of Engineers) has issued or is responsible for the following leases, licenses, rights-of-way or easements on or across the surface of the application area:

1) FM 2336 Right-of-Way. In 1957, for a period of 50 years, a right-of-way and easements to the State of Texas for F.M. 2336 and diversion ditches. The right-of-way plus a 100-foot buffer zone north of the road contains 15 acres. (This right-of-way is also discussed in the analysis for Criterion No. 3).

2) LCRA Transmission Line Right-of-Way. LCRA owns a right-of-way for a H-frame overhead 66 KVA electric transmission line, containing approximately 10.2 acres in the lease application area. This right-of-way was issued by private parties before DOA acquired Camp Swift, and the titles transferring the properties to the DOA included a special provision honoring any existing rights-of-way. No fixed term in known for the LCRA right-of-way; therefore, for this analysis the term was considered to be permanent.

3) The University of Texas System's Cancer Research Center Lease. On January 1, 1980, a lease for miscellaneous purposes for a period of 5 years to the University of Texas System, Cancer Research Center. For practical reasons, the area analyzed for unsuitability will consist of the Cancer Research Center lease consisting of 56 acres plus 29 acres between the lease and FM 2336, a total of 85 acres. (This lease is also discussed in the analysis of Criterion No. 6).

4) Texas National Guard License. On January 1, 1978, a license for a period of 25 years, to the Texas National Guard for use of 11,740 acres (the entire reservation) including all of the lease application area.

5) Texas Utilities Fuel Company Pipeline Right-of-Way. In 1969, for a period of 50 years, a 70-foot right-of-way to Bi-Stone Fuel Company for a 20-inch buried natural gas pipeline. (On June 1, 1975, Bi-stone became Texas Utilities Fuel Company.) The right-of-way contains 0.5 acre on the application area.



Exception Analysis: Exception (iv) to this criterion provides that if the parties involved in the rights-of-way or easements agree to leasing in writing that the area may be leased.

Exception (v) provides that, if it is impractical to exclude the areas from a lease and the areas or uses can be protected through stipulations, then leasing may occur.

DOA granted its consent to leasing (with certain stipulations) in a letter from the Office of the Assistant Secretary (DOA) dated August 31, 1980 (Attachment 2).

1) F.M. 2336 Right-of-Way. In a letter to BLM dated July 1, 1980 (Attachment 3), the Texas Department of Highways and Public Transportation indicated that it is willing to cooperate with a relocation of F.M. 2336, pursuant to the requirements of Texas law. Therefore, exception (iv) may be applied. However, because exception analysis has not been completed for Criterion No. 3 (which also applies to F.M. 2336), this right-of-way is presently considered unsuitable.

2) LCRA Transmission Line Right-of-Way. In a letter to BLM dated March 28, 1980 (Attachment 4), LCRA indicated that they are willing to relocate their transmission line outside the lease area. Therefore, exception (iv) applies.

3) The University of Texas System's Cancer Research Center Lease. Consultation with the University of Texas has been initiated to determine whether, in their opinion, it would be possible to protect their activities through lease stipulations (Attachment 5). If the University agrees, a stipulation protecting the Center's use and activities could be attached to the lease and exception (iv) and/or (v) could be applied. However, at the present time, no agreement to leasing has been received; therefore, the Center's lease area is presently considered unsuitable.

4) Texas National Guard License. Consultations conducted with the Texas National Guard indicate that the Guard's use of the area can be protected through stipulations attached to the lease by DOA. (The stipulations are listed in the DOA consent letter, Attachment 2). Therefore, exception (v) applies.

5) Texas Utilities Fuel Company Pipeline Right-of-way. This ROW cuts across a very small section of the proposed lease area. Since it does not run over any strippable coal reserves (lignite dips well below 200 feet), it will be deleted from the lease area.

Summary: After deleting the Texas Utilities Fuel Company right-of-way from the proposed lease area, exceptions are applicable to the Texas National Guard license and the LCRA transmission line right-of-way. Although exception analysis is still ongoing for the Cancer Research Center lease and F.M. 2336, they are both presently considered unsuitable for surface mining and have been deleted from the proposed lease area.

Data Sources: Written communication, 1979, Chief, Division of Real Estate, Fort Worth District, Corps of Engineers, DOA. Written communication, 1980, Engineer Director, Texas State Department of Highways, and Public Transportation. Written communication, 1980, Director of Environmental Resources, Lower Colorado River Authority. Written communication, 1978, Office of the Assistant Secretary (DOA). Texas Army National Guard.

Criterion No. 3

Analysis: Criterion No. 3 applies to the following public roads, institutional buildings, and cemeteries:

- 1) F.M. 2336 (see also the discussion under Criterion No. 2). The right-of-way and required buffer zone contain 15 acres on the lease application area.
- 2) Buildings of the Texas Army National Guard. The total area occupied by the buildings and immediate facilities is approximately 36 acres (this area includes the 300-foot required buffer zone).
- 3) State Highway 95. A 100-foot buffer zone (totalling approximately 35 acres) must be left along this highway.
- 4) Three Cemeteries. Approximately four acres are required to protect the cemeteries including the 100-foot buffer around each cemetery.

Exception Analysis:

- 1) F.M. 2336. Exception (ii) permits leasing if the Office of Surface Mining (OSM) has issued a permit to have a public highway moved. In a letter dated June 18, 1980 (Attachment 6), OSM indicated that contrary to exception (ii), "OSM has no authority to issue a permit to relocate a road on Federal lands prior to leasing by BLM". DOI Instruction Memorandum No. 80-371 (dated March 17, 1980) indicates that exception (ii) may be applied if OSM agrees that issuance of a permit may be warranted in the future (see Attachment 7). It is felt that OSM should have an opportunity to review the DEIS and this draft unsuitability assessment before further consultation is carried out. In the meantime, FM 2336 will be considered unsuitable. A final determination will be made after the public comment period.
- 2) Texas National Guard Buildings. Exception (iii) allows owners of occupied buildings to give permission for mining to occur closer than the specified 300 feet. As indicated in the analysis for Criterion No. 2, the DOA has provided its consent to leasing on the condition that the Guard's facilities be moved and the activities of the Guard not be disrupted (Attachment 2). This stipulation meets the exception (iii) requirements (see Attachment 1a).
- 3) State Highway 95. No exceptions apply to the required 100-foot buffer zone.
- 4) Three Cemeteries. No exceptions apply. However, Texas state law (Article 912a-22, Title 26, Vernon's Annotated Texas Statutes) permits removal

of cemeteries under prescribed conditions. DOA is considering having the cemeteries removed if a suitable new location can be found and if required permissions from the heirs can be obtained. Before approval of a lease sale, the areas containing the cemeteries will be reexamined to determine if any or all have been moved to locations outside the lease application area.

Summary: The 100-foot buffer zone for Texas State Highway 95 and the three cemeteries (including buffer zones) are considered unsuitable. FM 2336 is also considered unsuitable at present; however, consultation on applying exception (ii) will continue. The site of the Texas National Guard facilities is considered suitable with the condition that the lessee meets all applicable DOA lease stipulations to protect the Guard's use of Camp Swift.

Data Sources: Aerial photographs. USGS 15' topographic maps (Bastrop, Elgin, Lexington, Smithville). Written communication, 1980, Acting Regional Director, Region IV, Office of Surface Mining, USDI. Texas Railroad Commission.

#### Criterion No. 4

Analysis: None of the 6,740-acre area possesses the characteristics of, or is included in, a wilderness study area.

Data Source: Dan Wood, BLM Wilderness Coordinator, NMSO.

#### Criterion No. 5

Analysis: No part of Camp Swift has been designated as Class 1 (areas of outstanding scenic quality or high visual sensitivity).

Data Source: Mike Bunker, BLM Outdoor Recreation Planner, Roswell District Office.

#### Criterion No. 6

Analysis: A Lease for Miscellaneous Purposes was issued by DOA on January 1, 1980, to the Cancer Research Center of the University of Texas for 56 acres lying south of F.M. 2336. (The area being analyzed for unsuitability consists of 85 acres. See analysis for Criterion No. 2). The lease, which is renewable, expires on December 31, 1984.

The criterion provides that if the chief scientific user or agency consents, the area may be leased. A request for consent to leasing has been sent to the Chancellor of the University of Texas System (Attachment 5). No response has been received to date. (The Cancer Research Center lease is also discussed in the analysis for Criterion No. 2).

Summary: Until a consent to leasing has been provided by the Cancer Research Center, the center's lease area will be considered unsuitable.

Data Source: Real Estate Division, Corps of Engineers, Ft. Worth District, DOA.

Criterion No. 7

Analysis: A partial inventory of the lease application area has been completed and the results published in A Cultural Resource Inventory and Assessment at Camp Swift, Texas (Duford W. Skelton and Martha Doty Freeman, Texas Archeological Survey Report No. 72, 1979). That survey discovered no sites on the lease application area which are included in the National Register of Historic Places.

In consultation with the Texas State Historic Preservation Officer (SHPO), BLM has determined that the cultural sites on the application area should be recommended as eligible for the National Register as a Multiple Resource Area. A Multiple Resource Area nomination includes a defined portion of the cultural resources in a specified geographical area. The size of the area is determined by the historic (rather than thematic) relationship of the sites and by their manageability as a geographic unit.

With respect to the Camp Swift sites, "While none of the sites appear to individually possess great scientific value, as a group they reflect a pattern of human usage through time. They contain information important to an understanding of prehistory and early history in an area that has received little professional study..." (See SHPO's letter, Attachment 8). The importance of the Camp Swift sites lies in their information potential rather than their in-place integrity. The NMSO is nominating them as a Multiple Resource Area in order to ensure that they are salvaged as a group and in a manner which will provide an integrated history of human use of the area. The NMSO is requesting the National Register for concurrence with the above recommendation. The request was not completed in time for inclusion in this draft unsuitability assessment; some additional information on site boundaries is needed. It is expected that coordination with the National Register will be completed before the final assessment is prepared.

Exception Analysis: The exception to Criterion No. 7 allows leasing and mining if, after consultation with the Advisory Council on Historic Preservation and the SHPO, it is determined that mining will not cause significant adverse impacts to the property.

The Camp Swift sites have little in-place value. They are important for the information they can yield about human use of the area. Accordingly, BLM and the SHPO have determined that salvaging the sites prior to mining and recovering the information in them would be appropriate mitigation and would prevent significant adverse impacts to the property (Attachment 8). Accordingly, lease stipulations will be set requiring the lessee, before approval of a mining and reclamation plan, (1) to conduct supplementary inventories as necessary and (2) to submit a comprehensive mitigation plan for approval by BLM and the SHPO. BLM is requesting concurrence for this procedure from the Advisory Council.

Summary: On the conditions that the above stipulations will be included in any Camp Swift lease and that the lessee will satisfactorily salvage the cultural resources prior to mining, the exception is considered to be applicable. Therefore, no lands in the proposed lease area are considered unsuitable under this criterion.

Data Source: A Cultural Resource Inventory and Assessment at Camp Swift, Texas, Duford W. Skelton and Martha Doty Freeman, Texas Archaeological Survey Report No. 72, 1979. Texas SHPO.

Criterion No. 8

Analysis: None of these federal lands have been designated as a Natural Area or included in a National Natural Landmark.

Data Source: Geoffrey Middaugh, BLM Recreation Planner, NMSO.

Criterion No. 9

Analysis: Within the Camp Swift Military Reservation, there is no legally designated critical habitat for federal threatened or endangered species (T/E) or any habitat for T/E species considered to be of essential value and where the presence of T/E species has been scientifically documented to be present. Note: Consultation with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act has been initiated and a T/E species list response has been received. The T/E species list for the Camp Swift area includes: Bald Eagle (*Haliaeetus leucocephalus*), Houston Toad (*Bufo houstonensis*), and the American Alligator (*Alligator mississippiensis*). Critical habitat has been designated in Bastrop County for the Houston Toad. None of this designated critical habitat lies within Camp Swift boundaries.

A biological assessment has been completed on the three listed T/E species for Camp Swift and a "no effect" determination has been made as a result of the proposed action and alternatives. The T/E list request and list response are appended as Attachments 9 and 9a.

Consultation with the USFWS under Section 7 of the Endangered Species Act has been completed.

Data Source: Regional Director, Region 2, USFWS, Albuquerque, N.M. Radian Corp., Austin, Texas.

Criterion No. 10

Analysis: Within Camp Swift Military Reservation, there is no habitat determined to be critical or essential for any plant or animal species listed by the State of Texas, pursuant to state law, as endangered or threatened. Note: Consultation with the State of Texas has been conducted and critical or essential habitat for plant or animal species listed by the state as threatened or endangered was found to be non-existent. The state T/E list request and list response are appended as Attachments 10 and 10a.

Data Source: Mr. Charles D. Travis, Executive Director, Texas Parks and Wildlife Department, Austin, Texas. Radian Corp., Austin, Texas.

Criterion No. 11

Analysis: There are no bald or golden eagle nests or sites known or suspected to exist within the confines of Camp Swift Military Reservation.

Note: The bald eagle is one of the T/E species listed by the FWS for the Camp Swift area. See: Criterion No. 9, above.

Data Source: USFWS T/E species list response, Albuquerque, N.M. Selected LCRA Inputs for Environmental Report - Camp Swift Lignite Lease, Chapter 2, TERA Corporation, Dallas, Texas. Radian Corporation, Austin, Texas.

#### Criterion No. 12

Analysis: No bald or golden eagle roost or concentration areas used during migration and wintering are known or suspected to occur within the confines of Camp Swift Military Reservation.

Note: See: Criterion No. 9, above.

Data Source: USFWS T/E species list response, Albuquerque, New Mexico. Selected LCRA Inputs for Environmental Report - Camp Swift Lignite Lease, Chapter 2, TERA Corporation, Dallas, Texas. Radian Corporation, Austin, Texas.

#### Criterion No. 13

Analysis: There are no falcon cliff nesting sites or any suitable cliff areas for falcon nests within the confines of Camp Swift Military Reservation.

Data Source: Selected LCRA Inputs for Environmental Report - Camp Swift Lignite Lease, Chapter 2, TERA Corporation, Dallas, Texas. Radian Corporation, Austin, Texas.

#### Criterion No. 14

Analysis: There is no high priority habitat for migratory bird species of high federal interest, on a regional or national basis, known to exist within Camp Swift Military Reservation. Consequently, no further analysis is required.

Note: Consultation with the USFWS, Office of Migratory Bird Management, through the BIM Office of Coal Management (Mr. Don Brabson), was initiated with a resultant list of high interest migratory bird species for Bastrop County, Texas. This list includes: Swainsons warbler, Pine warbler, Golden-cheeked warbler, Pileated woodpecker, Red-shouldered hawk, Least tern and the Great blue heron.

Data Source: D. Slack, Ornithologist, Texas A&M University, College Station, Texas. A. Gallucci, Research Assistant, Texas A&M University, College Station, Texas. F. Potter, Wildlife Biologist, Texas Parks and Wildlife Department, Austin, Texas. Radian Corporation, Austin, Texas. BIM, W.O. IM No. 80-347. T. Cloud, Coal Coordinator (TEX), USFWS, Ft. Worth, Texas.

#### Criterion No. 15

Analysis: There is no fish and wildlife habitat for resident species of high interest to the state and which is essential for maintaining these priority

wildlife species, known or suspected to exist within the confines of Camp Swift Military Reservation.

Note: Consultation with the state of Texas on Criterion No. 15 has been conducted and wildlife habitat for resident species of high interest to the state was found to be non-existent. The state high interest habitat request and response are appended as Attachments 10 and 10a.

Data Source: Mr. Charles D. Travis, Executive Director, Texas Parks and Wildlife Department, Austin, Texas. Camp Swift EIS, Radian Corporation, Austin, Texas.

#### Criterion No. 16

Analysis: The approximate location of the 100-year floodplains on the lease application area is shown on Map 4. The information used to compile the maps was taken from the U.S. Department of Housing and Urban Development, Special Flood Hazard Areas maps.

In a letter to BLM dated April 15, 1980 (Attachment 11), U.S. Geological Survey (USGS) indicated, using the language of the criterion, that "mining will not cause substantial threat of loss to people or property, and beneficial values of the floodplain on the lease tract downstream." This response fulfills a requirement of the criterion for such a determination. Impact analysis done for the DEIS also indicates that mining would cause no substantial threats to people or to the floodplains. Consequently, none of the proposed lease area is presently considered unsuitable under this criterion.

Data Sources: U.S. Department of Housing and Urban Development. Written communication, 1980, District Chief, USGS, Water Resources Division, Austin, Texas.

#### Criterion No. 17

Analysis: None of these federal lands have been committed by the DOA for use as a municipal watershed.

Data Source: Real Estate Division, Corps of Engineers, Fort Worth District, DOA.

#### Criterion No. 18

Analysis: None of these federal lands lie within, or within 1/4 of a mile of, an area designated as a Natural Resource Water.

Data Source: Real Estate Division, Corps of Engineers, Fort Worth District, DOA.

Criterion No. 19

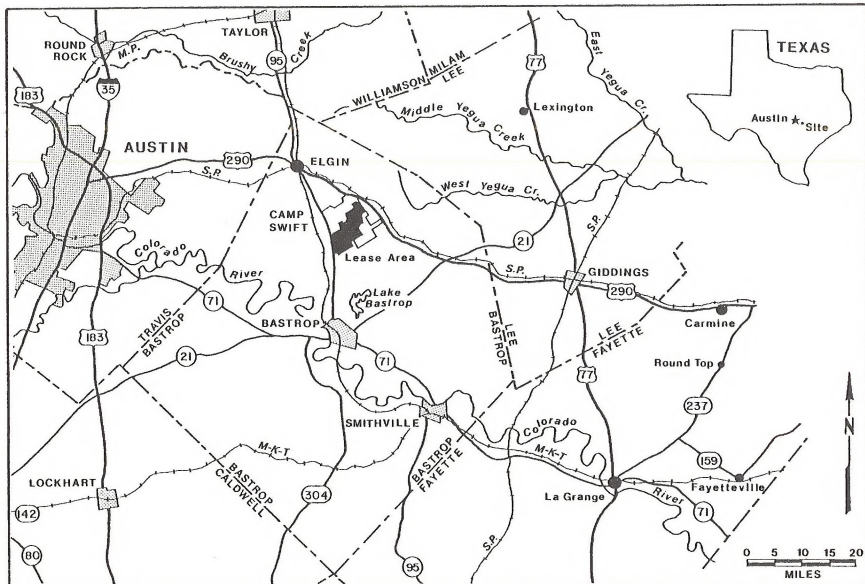
Analysis: This criterion, which concerns mining of alluvial valley floors, is not applicable to areas such as Camp Swift which lie east of the 100 West Meridian.

Criterion No. 20

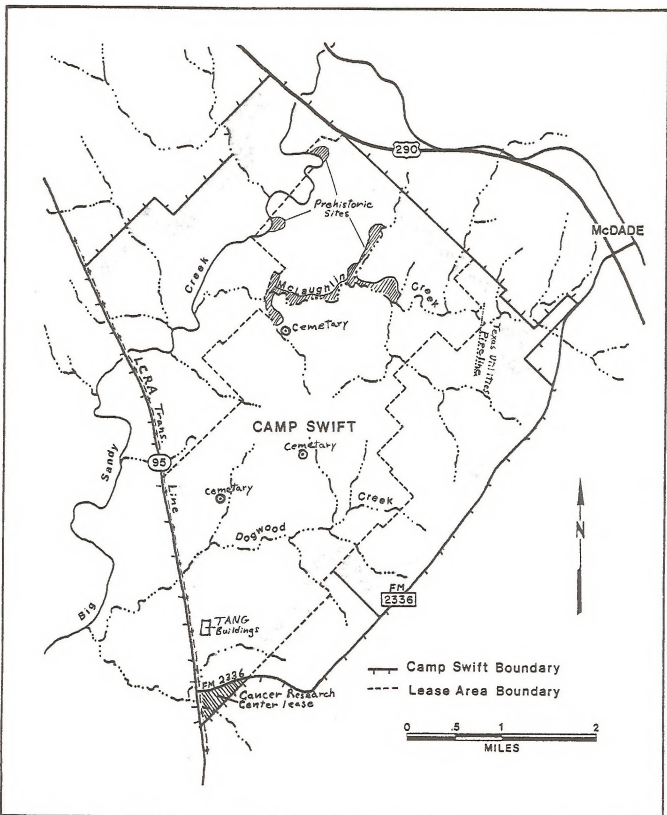
Analysis: No lands which have been proposed as unsuitable by the State of Texas and approved as unsuitable by the Secretary of the Interior are included in the lease application.

Data Source: Oral communication, Vika Newsom, Texas Railroad Commission, Surface Mining Division.



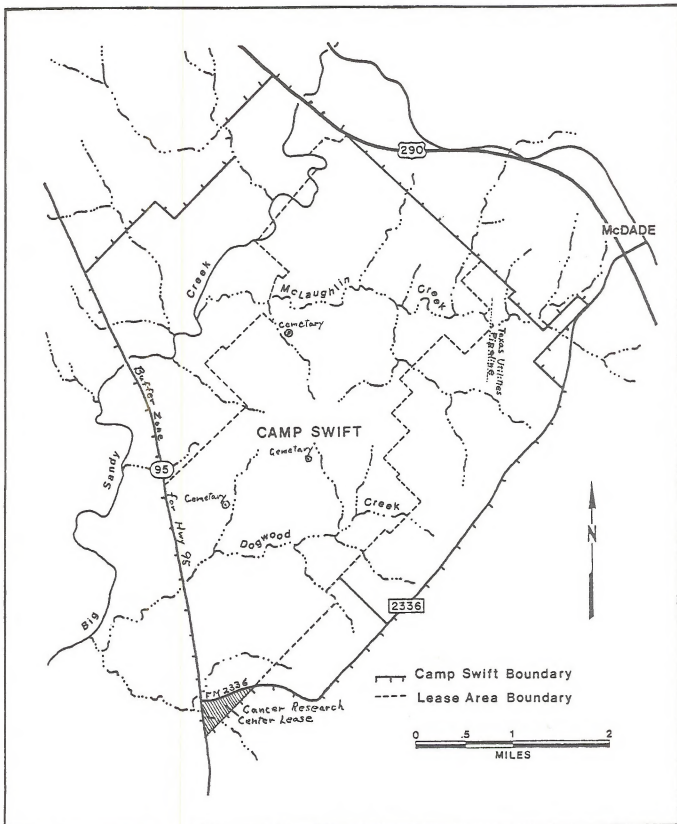


Map 1 Project Vicinity

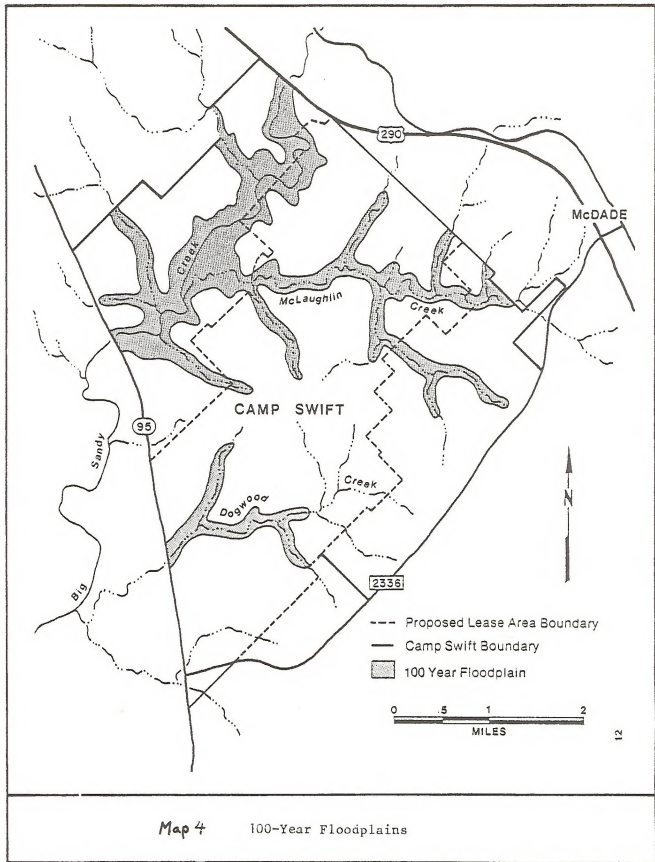


Map 2

Areas Analyzed in Relation to Unsuitability Criteria



Map 3 Areas Presently Considered Unsuitable



(i) approval of the transfer is necessary to carry out the purposes of the Federal Coal Leasing Amendments Act of 1976;

(ii) approval of the transfer is in the public interest; and

(iii) there are no reasonable alternatives to approval of the transfer consistent with the Federal Coal Leasing Amendments Act of 1976, the antitrust laws and the public interest.

#### § 3463.3-3 Effective date.

A transfer shall take effect the first day of the month following its final approval by the Bureau of Land Management, or if the transferee requests, the first day of the month of the approval.

#### § 3463.3-4 Extensions.

The filing of or approval of any transfer shall not alter any terms or extend any time periods under the lease, including those dealing with readjustment of the lease and the diligent development and continued operation on the lease.

### PART 3460—ENVIRONMENT

#### Subpart 3461—Federal Lands Review—Unsuitability for Mining

Sec.

3461.0-3 Authority.

3461.0-6 Policy.

3461.0-7 Scope.

3461.1 Criteria for assessing lands unsuitable for all or certain stipulated methods of coal mining.

3461.2 Underground mining exception from criteria.

3461.3 Unsuitability assessment procedures.

3461.3-1 Assessment and land use planning.

3461.3-2 Consultation on unsuitability assessments.

3461.3-3 Findings.

3461.4 Relationship of leasing to unsuitability assessment.

3461.4-1 Application of criteria on unleased lands.

3461.4-2 Application of criteria on leased lands.

3461.5 Petitions to designate lands.

3461.6 Exploration.

#### Subpart 3465—Surface Management and Protection

3465.0-1 Purpose.

3465.0-2 Objective.

3465.0-3 Authority.

3465.0-7 Applicability.

3465.1 Use of surface.

3465.2 Obligations and standards of performance.

3465.3 Inspections and noncompliance.

3465.3-1 Inspections.

3465.3-2 Discovery of noncompliance.

3465.3-3 Failure of lessee or holder of license to mine to act.

3465.4 Alternative postmining land use.

3465.5 Bonding.

3465.6 Conduct, completion, and abandonment of operations.

Authority: 30 U.S.C. 181 et seq.; 30 U.S.C. 351-359; 30 U.S.C. 521-531; 30 U.S.C. 1201 et seq.; and 43 U.S.C. 1701 et seq.

#### Subpart 3461—Federal Lands Review—Unsuitability for Mining

##### § 3461.0-3 Authority.

(a) These regulations are issued under the authority of the statutes listed in § 3400.0-3 of this title.

(b) These regulations primarily implement:

(1) The general unsuitability criteria in section 522(a) of the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1272(a));

(2) The Federal lands review in section 522(b) of the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1272(b)); and

(3) The prohibitions against mining certain lands in section 522(e) of the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1272(e)).

##### § 3461.0-6 Policy.

The Department shall carry out the review of Federal lands under section 522(b) of the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1272(b)) principally through land use planning assessments by the surface management agency regarding the unsuitability of Federal lands for all or certain stipulated methods of coal mining.

##### § 3461.0-7 Scope.

Each criterion in § 3461.1 of this title uses the phrase "shall be considered unsuitable" as shorthand for "shall be considered unsuitable for all or certain stipulated methods of coal mining involving surface coal mining operations, as defined in § 3400.0-5(vv) of this title. The manner in which the criteria are phrased does not diminish the scope of the general underground mining exception (43 CFR 3461.2), or the obligation of the authorized officer to describe in the comprehensive land use plan or land use analysis whether lands assessed as unsuitable are unsuitable for all or only certain stipulated methods of coal mining (43 CFR 3420.2-3(c), 3461.3).

(a)(1) *Criterion Number 1.* All Federal lands included in the following land systems or categories shall be considered unsuitable: National Park System, National Wildlife Refuge System, National System of Trails,

National Wilderness Preservation System, National Wild and Scenic Rivers System, National Recreation Areas, lands acquired with money derived from the Land and Water Conservation Fund, National Forests, and Federal lands in incorporated cities, towns, and villages. All Federal lands which are recommended for inclusion in any of the above systems or categories by the administration in legislative proposals submitted to the Congress or which are required by statute to be studied for inclusion in such systems or categories shall be considered unsuitable.

(2) *Exceptions.* (i) A lease may be issued within the boundaries of any National Forest if the Secretary finds no significant recreational, timber, economic or other values which may be incompatible with the lease; and (A) surface operations and impacts are incident to an underground coal mine, or (B) where the Secretary of Agriculture determines, with respect to lands which do not have significant forest cover within those National Forests west of the 100th meridian, that surface mining may be in compliance with the Multiple-Use Sustained-Yield Act of 1960, the Federal Coal Leasing Amendments Act of 1976 and the Surface Mining Control and Reclamation Act of 1977. (ii) A lease may be issued within the Custer National Forest with the consent of the Department of Agriculture as long as no surface coal mining operations are permitted.

(3) *Exemptions.* The application of this criterion to lands within the listed land systems and categories is subject to valid existing rights, and does not apply to surface coal mining operations existing on August 3, 1977. The application of the portion of this criterion applying to land proposed for inclusion in the listed systems does not apply to lands to which substantial legal and financial commitments were made prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(b)(1) *Criterion Number 2.* Federal lands that are within rights-of-way or easements or within surface leases for residential, commercial, industrial, or other public purposes, or for agricultural crop production on Federally owned surface shall be considered unsuitable.

(2) *Exceptions.* A lease may be issued, and mining operations approved, in such areas if the surface management agency determines that:

(i) All or certain types of coal development (e.g., underground mining)

will not interfere with the purpose of the right-of-way or easement; or

(ii) The right-of-way or easement was granted for mining purposes; or

(iii) The right-of-way or easement was issued for a purpose for which it is not being used; or

(iv) The parties involved in the right-of-way or easement agree, in writing, to leasing; or

(v) It is impractical to exclude such areas due to the location of coal and method of mining and such areas or uses can be protected through appropriate stipulations.

(3) *Exemptions.* This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(c)(1) *Criterion Number 3.* Federal lands affected by section 522(e) (4) and (5) of the Surface Mining Control and Reclamation Act of 1977 shall be considered unsuitable. This includes lands within 100 feet of the outside line of the right-of-way of a public road or within 100 feet of a cemetery, or within 300 feet of any public building, school, church, community or institutional building or public park or within 300 feet of an occupied dwelling.

(2) *Exceptions.* A lease may be issued for lands:

(i) Used as mine access roads or, haulage roads that join the right-of-way for a public road;

(ii) For which the Office of Surface Mining Reclamation and Enforcement has issued a permit to have public roads relocated;

(iii) For which owners of occupied buildings have given written permission to mine within 300 feet of their buildings.

(3) *Exemptions.* The application of this criterion is subject to valid existing rights, and does not apply to surface coal mining operations existing on August 3, 1977.

(d)(1) *Criterion Number 4.* Federal lands designated as wilderness study areas shall be considered unsuitable while under review by the Administration and the Congress for possible wilderness designation. For any Federal land which is to be leased or mined prior to completion of the wilderness inventory by the surface management agency, the environmental assessment or impact statement on the lease sale or mine plan shall consider whether the land possesses the characteristics of a wilderness study area. If the finding is affirmative, the land shall be considered unsuitable,

unless issuance of noncompetitive coal leases and mining on leases is authorized under the Wilderness Act and the Federal Land Policy and Management Act of 1976.

(2) *Exemption.* The application of this criterion to lands for which the Bureau of Land Management is the surface management agency and lands in designated wilderness areas in National Forests is subject to valid existing rights.

(e)(1) *Criterion Number 5.* Scenic Federal lands designated by visual resource management analysis as Class I (an area of outstanding scenic quality or high visual sensitivity) but not currently on the National Register of Natural Landmarks shall be considered unsuitable. A lease may be issued if the surface management agency determines that surface coal mining operations will not significantly diminish or adversely affect the scenic quality of the designated area.

(2) *Exemptions.* This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(f)(1) *Criterion Number 6.* Federal lands under permit by the surface management agency, and being used for scientific studies involving food or fiber production, natural resources, or technology demonstrations and experiments shall be considered unsuitable for the duration of the study, demonstration or experiment, except where mining could be conducted in such a way as to enhance or not jeopardize the purposes of the study, as determined by the surface management agency, or where the principal scientific user or agency gives written concurrence to all or certain methods of mining.

(2) *Exemptions.* This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(g)(1) *Criterion Number 7.* All districts, sites, buildings, structures, and objects of historic, architectural, archeological, or cultural significance on Federal lands which are included in or eligible for inclusion in the National Register of Historic Places, and an appropriate buffer zone around the outside boundary of the designated property (to protect the inherent values of the property that make it eligible for

listing in the National Register) as determined by the surface management agency, in consultation with the Advisory Council on Historic Preservation and the State Historic Preservation Office shall be considered unsuitable.

(2) *Exceptions.* All or certain stipulated methods of coal mining may be allowed if the surface management agency determines, after consultation with the Advisory Council on Historic Preservation and State Historic Preservation Office that the direct and indirect effects of mining, as stipulated, on a property in or eligible for the National Register of Historic Places will not result in significant adverse impacts to the property.

(3) *Exemptions.* The application of this criterion to a property listed in the National Register is subject to valid existing rights, and does not apply to surface coal mining operations existing on August 3, 1977. The application of the criterion to buffer zones and properties eligible for the National Register does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(h)(1) *Criterion Number 8.* Federal lands designated as natural areas or as National Natural Landmarks shall be considered unsuitable.

(2) *Exceptions.* A lease may be issued and mining operation approved in an area or site if the surface management agency determines that:

(i) With the concurrence of the state, the area or site is of regional or local significance only;

(ii) The use of appropriate stipulated mining technology will result in no significant adverse impact to the area or site; or

(iii) The mining of the coal resource under appropriate stipulations will enhance information recovery (e.g., paleontological sites).

(3) *Exemptions.* This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which includes operations on which a permit has been issued.

(i)(1) *Criterion Number 9.* Federally designated critical habitat for threatened or endangered plant and animal species, and habitat for Federal threatened or endangered species which is determined by the Fish and Wildlife Service and the surface management

agency to be of essential value and where the presence of threatened or endangered species has been scientifically documented, shall be considered unsuitable.

(2) *Exception.* A lease may be issued and mining operations approved if, after consultation with the Fish and Wildlife Service, the Service determines that the proposed activity is not likely to jeopardize the continued existence of the listed species and/or its critical habitat.

(j)(1) *Criterion Number 10.* Federal lands containing habitat determined to be critical or essential for plant or animal species listed by a state pursuant to state law as endangered or threatened shall be considered unsuitable.

(2) *Exception.* A lease may be issued and mining operations approved if, after consultation with the state, the surface management agency determines that the species will not be adversely affected by all or certain stipulated methods of coal mining.

(3) *Exemptions.* This criterion does not apply to lands to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(k)(1) *Criterion Number 11.* A bald or golden eagle nest or site on Federal lands that is determined to be active and an appropriate buffer zone of land around the nest site shall be considered unsuitable. Consideration of availability of habitat for prey species and of terrain shall be included in the determination of buffer zones. Buffer zones shall be determined in consultation with the Fish and Wildlife Service.

(2) *Exceptions.* A lease may be issued if:

(i) It can be conditioned in such a way, either in manner or period of operation, that eagles will not be disturbed during breeding season; or

(ii) The surface management agency, with the concurrence of the Fish and Wildlife Service, determines that the golden eagle nest(s) will be moved.

(iii) Buffer zones may be decreased if the surface management agency determines that the active eagle nests will not be adversely affected.

(l)(1) *Criterion Number 12.* Bald and golden eagle roost and concentration areas on Federal lands used during migration and wintering shall be considered unsuitable.

(2) *Exception.* A lease may be issued if the surface management agency determines that all or certain stipulated

methods of coal mining can be conducted in such a way, and during such periods of time, to ensure that eagles shall not be adversely disturbed.

(m)(1) *Criterion Number 13.* Federal lands containing a falcon (excluding kestrel) cliff nesting site with an active nest and a buffer zone of Federal land around the nest site shall be considered unsuitable. Consideration of availability of habitat for prey species and of terrain shall be included in the determination of buffer zones. Buffer zones shall be determined in consultation with the Fish and Wildlife Service.

(2) *Exception.* A lease may be issued where the surface management agency, after consultation with the Fish and Wildlife Service, determines that all or certain stipulated methods of coal mining will not adversely affect the falcon habitat during the periods when such habitat is used by the falcons.

(n)(1) *Criterion Number 14.* Federal lands which are high priority habitat for migratory bird species of high Federal interest on a regional or national basis, as determined jointly by the surface management agency and the Fish and Wildlife Service, shall be considered unsuitable.

(2) *Exception.* A lease may be issued where the surface management agency, after consultation with the Fish and Wildlife Service, determines that all or certain stipulated methods of coal mining will not adversely affect the migratory bird habitat during the periods when such habitat is used by the species.

(o)(1) *Criterion Number 15.* Federal lands which the surface management agency and the state jointly agree are fish and wildlife habitat for resident species of high interest to the state and which are essential for maintaining these priority wildlife species shall be considered unsuitable. Examples of such lands which serve a critical function for the species involved include:

(i) Active dancing and strutting grounds for sage grouse, sharp-tailed grouse, and prairie chicken;

(ii) Winter ranges most critical for deer, antelope, and elk; and

(iii) Migration corridors for elk.

A lease may be issued if, after consultation with the state, the surface management agency determines that all or certain stipulated methods of coal mining will not have a significant long-term impact on the species being protected.

(2) *Exemptions.* This criterion does not apply to lands to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations

were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(p)(1) *Criterion Number 16.* Federal lands in riverine, coastal, and special floodplains (100-year recurrence interval) shall be considered unsuitable unless, after consultation with Geological Survey, the surface management agency determines that all or certain stipulated methods of coal mining can be undertaken without substantial threat of loss to people or property, and to the natural and beneficial values of the floodplain on the lease tract and downstream.

(2) *Exemptions.* This criterion does not apply to lands to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(q)(1) *Criterion Number 17.* Federal lands which have been committed by the surface management agency to use as municipal watersheds shall be considered unsuitable.

(2) *Exception.* A lease may be issued where:

(i) The surface management agency determines, as a result of studies, that all or certain stipulated methods of coal mining will not adversely affect the watershed to any significant degree; and

(ii) The municipality (incorporated entity) or the responsible governmental unit concurs in writing in the issuance of the lease.

(3) *Exemptions.* This criterion does not apply to lands to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(r)(1) *Criterion Number 18.* Federal lands with National Resource Waters, as identified by states in their water quality management plans, and a buffer zone of Federal lands ¼ mile from the outer edge of the far banks of the water, shall be unsuitable.

(2) *Exception.* The buffer zone may be eliminated or reduced in size where the surface management agency determines that it is not necessary to protect the National Resource Waters.

(3) *Exemptions.* This criterion does not apply to lands to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

(s)(1) *Criterion Number 19.* Federal lands identified by the surface management agency, in consultation with the state in which they are located, as alluvial valley floors according to the definition in § 3400.0-5(a) of this title, the standards in 30 CFR Part 822, the final alluvial valley floor guidelines of the Office of Surface Mining Reclamation and Enforcement when published, and approved state programs under the Surface Mining Control and Reclamation Act of 1977, where mining would interrupt, discontinue, or preclude farming, shall be considered unsuitable. Additionally, when mining Federal land outside an alluvial valley floor would materially damage the quantity or quality of water in surface or underground water systems that would supply alluvial valley floors, the land shall be considered unsuitable.

(2) *Exemptions.* This criterion does not apply to surface coal mining operations which produced coal in commercial quantities in the year preceding August 3, 1977, or which had obtained a permit to conduct surface coal mining operations.

(1)(1) *Criterion Number 20.* Federal lands in a state to which is applicable a criterion (i) proposed by that state, and (ii) adopted by rulemaking by the Secretary, shall be considered unsuitable.

(2) *Exemptions.* A lease may be issued when:

(i) Such criterion is adopted by the Secretary less than 6 months prior to the publication of the draft comprehensive land use plan or land use analysis, plan, or supplement to a comprehensive land use plan, for the area in which such land is included, or

(ii) After consultation with the state, the surface management agency determines that all or certain stipulated methods of coal mining will not adversely affect the value which the criterion would protect.

(3) *Exemptions.* This criterion does not apply to lands: to which the operator made substantial legal and financial commitments prior to January 4, 1977; on which surface coal mining operations were being conducted on August 3, 1977; or which include operations on which a permit has been issued.

§ 3461.2 Underground mining exemption from criteria.

(a) Federal lands with coal deposits that would be mined by underground mining methods shall not be assessed as unsuitable where there would be no surface coal mining operations, as defined in § 3400.0-5 of this title, on any lease, if issued.

(b) Where underground mining will include surface operations and surface impacts on Federal lands to which a criterion applies, the lands shall be assessed as unsuitable unless the surface management agency finds that a relevant exception or exemption applies. Surface impacts include surface occupancy, subsidence, fire, and other environmental impacts of underground mining which are manifested on the surface.

§ 3461.3 Unsuitability assessment procedures.

§ 3461.3-1 Assessment and land use planning.

(a)(1) The authorized officer of the surface management agency shall describe in the comprehensive land use plan or land use analysis the results of the application of each of the unsuitability criteria. Exceptions shall only be considered when an unsuitability condition exists in an area free of other unsuitability conditions, and for which the responsible official would otherwise regard coal mining as a likely use. Should the authorized officer further determine that conditions for an exception exist, the authorized officer shall state each area to which an exception has been applied. The authorized officer shall state in the plan or analysis those areas which could be leased only subject to conditions or stipulations to conform to the application of the criteria or exceptions.

(2) At such time as the criteria and exceptions are applied in land use planning, the authorized officer shall invite public comment thereon through a notice published in the Federal Register and a newspaper of general circulation in the area covered by the plan or analysis. The notice shall announce the availability of a map or maps displaying those areas:

- (i) to which no criteria would apply;
- (ii) to which a criterion or criteria cannot be applied pending collection of data under paragraph (b) below;
- (iii) to which a criterion would apply;
- (iv) to which a criterion would apply where the authorized officer does not intend to consider an exception; and
- (v) to which a criterion and an exception thereto have been applied.

(b)(1) The authorized officer shall make his assessment on the best available data that can be obtained given the time and resources available to prepare the plan. The comprehensive land use plan or land use analysis shall include an indication of the adequacy and reliability of the data involved. Where either a criterion or exception

(when under subsection (a) of this section the authorized officer decides that application of an exception is appropriate) cannot be applied during the land use planning process because of inadequate or unreliable data, the plan or analysis shall discuss the reasons therefor and disclose when activity planning, or, in the case of criterion 19, prior to approval of a permit, the data needed to make an assessment with reasonable certainty would be generated. The authorized officer shall make every effort within the time and resources available to collect adequate and reliable data which would permit the application of criterion 19 in the land use or activity planning process. When those data are obtained, the authorized officer shall make public his assessment on the application of the criterion or, if appropriate, the exception and the reasons therefor and allow opportunity for public comment.

(2) No lease tract shall be analyzed in a final regional lease sale environmental impact statement prepared under § 3420.4-5 of this title without significant data material to the application to the tract of each criterion described in § 3461.1 of this title, except, where necessary, criterion 19. If the data are lacking for the application of a criterion or exception to only a portion of the tract, and if the authorized officer determines that it is likely that stipulations in the lease or permit to conduct surface coal mining operations could avoid any problems which may result from subsequent application of the criterion or exception, such tract may be included and analyzed in the regional lease sale environmental impact statement.

(c) Any unsuitability assessments which result either from a designation or a termination of a designation of Federal lands as unsuitable by the Office of Surface Mining Reclamation and Enforcement, or from changes warranted by additional data acquired in the activity planning process, may be made without formally revising or amending the comprehensive land use plan or analysis.

§ 3461.3-2 Consultation on unsuitability assessments.

(a) Prior to adopting a comprehensive land use plan or land use analysis which assesses Federal lands as unsuitable for coal mining, the Secretary or other surface management agency shall complete the consultation set out in § 3420.2-6 of this title.

(b) When consultation or concurrence is required in the application of any criterion or exception in § 3461.1 of this



title, the request for advice or concurrence, and the reply thereto, shall be in writing. Unless another period is provided by law, the authorized officer shall specify that the requested advice, concurrence or nonconcurrence be made within 30 days. Extensions of time that do not jeopardize the planning schedule may be granted for reply.

(c) When the authorized officer does not receive a response either to a request for concurrence which is required by this subpart but not by law or to consultation within the specified time, he or she may proceed as though concurrence had been given or consultation had occurred. If the authorized officer takes action not in accordance with advice received in consultation under this subpart, he or she shall set forth the reasons therefor in the comprehensive land use plan, land use analysis or other document containing the results of the application of the specific unsuitability criterion or exception.

#### § 3461.3-3 Findings.

When the authorized officer assesses the Federal lands as unsuitable, the authorized officer shall prepare a statement for such lands on the potential coal resources, the demand for coal resources, and the impact of such designation on the environment, the economy, and the supply of coal.

#### § 3461.4 Relationship of leasing to unsuitability assessment.

##### § 3461.4-1 Application of criteria on unleased lands.

(a) The unsuitability criteria shall be applied, prior to lease issuance, to all lands leased after the issuance of these regulations, including lands in noncompetitive (preference right) leases, applications and applications for leases under subpart 3425 of this title.

(b) The unsuitability criteria shall be initially applied either:

(1) During land use planning or the environmental assessment conducted for a specific lease application, lease modification, or preference right lease application under either § 3425.2 or § 3430.3 of this title or

(2) During land use planning under the provisions of § 3420.1-5 of this title.

##### § 3461.4-2 Application of criteria on leased lands.

(a) The unsuitability criteria shall be applied to all non-producing leases, issued prior to the effective date of these regulations. The Bureau of Land Management may await the lessee's submission of a mining plan before applying the unsuitability criteria. This

shall not preclude assessment of lands in an existing lease as part of the normal land use planning process.

(b) An unsuitability assessment of leased lands in the course of land use planning shall be conducted under the procedures in § 3461.3 of this title. An unsuitability assessment of leased lands during mining plan review shall be conducted, to the extent practicable, consistent with the procedures in § 3461.3 of this title. In either case, in assessing leased lands, if any criterion applies, each exception to it shall be applied. If a criterion does apply and the conditions do not permit an exception, a further decision shall be made on whether the leased land is exempt from the criterion because of the source of the authority for the criterion. Mining may be permitted on land to which no criterion applies; on land where a criterion applies but where the conditions permit an exception; and on land to which a criterion applies, no exception applies, but which is exempt from that criterion.

(c) If a lease area or portion of a lease area is assessed to be unsuitable for all or certain stipulated methods of coal mining or the lease is found to be incompatible with the comprehensive land use plan or land use analysis, the Secretary may, except as provided in § 3461.5 of this title, negotiate with the lessee for exchange of coal lease bidding rights or other mineral leases or coal lease modifications as described in subpart 3435 of this title. If a lease area is assessed to be unsuitable because of impacts to alluvial valley floors, the Secretary may initiate negotiations with the lessee to exchange the lease for another Federal coal lease in an area acceptable for mining operations under subpart 3436 of this title.

##### § 3461.5 Petitions to designate lands.

(a) Petitions to designate or terminate a designation of Federal lands as unsuitable for all or certain stipulated methods of surface coal mining shall be filed with and processed by the Surface Mining Officer under 30 CFR Part 769.

(b) After assessing unleased lands to be unsuitable in a comprehensive land use plan or land use analysis, the surface management agency may petition the Surface Mining Officer to designate the lands as unsuitable under 30 CFR Part 769.

(c) After assessing leased lands to be unsuitable under any criterion, its exceptions and exemptions, the surface management agency shall petition the Surface Mining Officer to designate the lands as unsuitable under 30 CFR Part 769.

(d) The completion of the unsuitability assessment by the surface management agency and filing of the petition under paragraph (b) or (c) of this section shall be deemed completion of the procedures in 30 CFR Part 769.14(c), (e)(1) and (g), and shall be deemed a recommendation for approval under 30 CFR 769.14(e)(2).

#### § 3461.6 Exploration.

(a) Assessment of any area as unsuitable for all or certain stipulated methods of coal mining pursuant to section 522 of the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1272) and the regulations of this subpart does not prohibit exploration of such area under subpart 3410 of this title.

(b) An application for an exploration license on any lands assessed as unsuitable for all or certain stipulated methods of coal mining shall be reviewed by the Bureau of Land Management to ensure that exploration does not harm any value for which the area has been assessed as unsuitable.

#### Subpart 3465—Surface Management and Protection

##### § 3465.0-1 Purpose.

This subpart establishes rules for the management and protection of the surface of leased Federal lands when coal deposits are developed.

##### § 3465.0-2 Objective.

This subpart is designed to ensure the use of effective and reasonable coal mining methods, and the reclamation of mined lands in a manner that will minimize any adverse social, economic, and environmental effects of coal mining.

##### § 3465.0-3 Authority.

These regulations are issued under the authority of the statutes listed in § 3400.0-3 of this title.

##### § 3465.0-7 Applicability.

This subpart applies to leases and licenses to mine, issued by the Bureau of Land Management for the development of Federal coal.

##### § 3465.1 Use of surface.

(a) The operator shall use only that part of the surface area included in his lease or license to mine that has been included in an approved permit (30 CFR Part 741).

(b) Separate leases, permits, or rights-of-way under the appropriate provisions in Title 43 of the Code of Federal Regulations are required for the installation of power generation plants or commercial or industrial facilities on

the lands in the lease or license to mine or for the use of mineral materials or timber from the land in the lease or license to mine.

(c) Other land uses under other authorities may be allowed on an area in a lease or license to mine provided there is no unreasonable conflict and that neither the mining operation nor the other use is jeopardized by the presence of the other.

**§ 3465.2 Obligations and standards of performance.**

(a) A lessee or a holder of a license to mine shall comply with the regulations in this subpart and with the terms and conditions of the lease or license to mine.

(b) A lessee or a holder of a license to mine shall comply with the applicable performance standards in 30 CFR Chapter VII, Subchapter D, and 30 CFR 211.

(c) When changed conditions or newly discovered information indicate that an approved permit (30 CFR Part 741) needs to be reviewed or supplemented, the authorized officer shall recommend any appropriate revision or supplement to the Surface Mining Officer.

(d) The authorized officer may, in the issuance of any lease or license to mine, develop and include additional specific stipulations in the lease or license to mine involving special management consideration.

**§ 3465.3 Inspections and noncompliance.**

**§ 3465.3-1 Inspections.**

The authorized officer, Mining Supervisor, or inspectors from the Surface Mining Officer shall have the right to enter lands under a lease or license to mine to inspect without advance notice or a search warrant, upon presentation of appropriate credentials, to determine whether the activities and conditions are in compliance with the applicable laws, regulations, notices and orders, terms and conditions of leases, licenses to mine or permits, and the requirements of the approved mining plan.

**§ 3465.3-2 Discovery of noncompliance.**

(a) Upon discovery of activities or conditions that are not in compliance with the terms of a lease or license to mine, or with an approved permit (30 CFR 741), but that do not pose a serious and imminent danger to the public or to resources and environmental quality, the authorized officer shall refer the matter to the Surface Mining Officer for remedial action, or to the Mining Supervisor on matters of exploration outside the permit area.

(b) Upon discovery of activities or conditions that are not in compliance with the terms of a lease, license to mine, or with an approved permit and that do pose a serious and imminent danger to the health and safety of the public or to resources and environmental quality, the authorized officer may order the immediate cessation of the activities or conditions provided that the Surface Mining Officer is immediately informed of the issuance of any such emergency cessation order.

**§ 3465.3-3 Failure of lessee or holder of license to mine to act.**

Failure of a lessee or the holder of a license to mine to comply with an immediate cessation order issued under § 3465.3-2(b) or with a written notice of noncompliance issued by the Surface Mining Officer in accordance with 30 CFR Part 211 or 30 CFR Chapter VII, Subchapter D, shall be grounds for suspension of the permit and may be grounds for cancellation of the license to mine, or in accordance with subpart 3452 of this title, the lease.

**§ 3465.4 Alternative postmining land use.**

(a) When a permit applicant, who holds a lease or a license to mine, proposes any postmining land use that is substantially different from the land use prior to exploration and mining, the Surface Mining Officer, with the approval of the authorized officer of the appropriate surface management agency, may review and approve or disapprove any postmining land use in accordance with the criteria established in 30 CFR 816.133.

(b) If the Surface Mining Officer determines that a decision to approve any alternative postmining land use or alternative rehabilitation practices would constitute a major Federal action requiring an environmental impact statement under section 102(2)(C) of the National Environmental Policy Act of 1969 (42 U.S.C. 4332(2)(C)) and that the decision has not been discussed in any environmental impact statement that may have been prepared for the issuance of the lease or the approval of the permit, a statement shall be prepared by the Surface Mining Officer.

**§ 3465.5 Bonding.**

(g) A lease bond for compliance with the terms of a lease or license to mine shall be furnished in accordance with the applicable provisions of subpart 3474 of this title.

(b) The provisions governing reclamation performance bonds are found in 30 CFR Part 742.

(c) A lease or license to mine may be denied any applicant or successful bidder who has previously forfeited a bond because of failure to comply with a permit unless the affected lands covered by that plan or permit have been reclaimed without cost to the Federal Government. Nothing in this section shall modify or limit the discretionary authority of the authorized officer to deny for other causes any bid or application for a lease or license to mine.

**§ 3465.6 Conduct, completion, and abandonment of operations.**

All terms of the permit shall be administered under 30 CFR Chapter VII, Subchapter D, and 30 CFR 211.

**PART 3470—COAL MANAGEMENT PROVISIONS AND LIMITATIONS**

**Subpart 3471—Coal Management Provisions and Limitations**

**Sec.**

- 3471.1 Land description requirements.
- 3471.1-1 Land description in application.
- 3471.1-2 Land description in lease.
- 3471.2 Effect of land transactions.
- 3471.2-1 Disposal of land with a reservation of minerals.
- 3471.2-2 Effect of conveyance to state or local entity.
- 3471.3 Cancellation or forfeiture.
- 3471.3-1 Cancellation or forfeiture for cause.
- 3471.3-2 Protection of bona fide purchaser.
- 3471.3-3 Sale of underlying interests.
- 3471.4 Future interest, acquired lands.

**Subpart 3472—Lease Qualification Requirements**

- 3472.1 Qualified applicants and bidders.
- 3472.1-1 Special leasing qualifications.
- 3472.1-2 Acreage limitations.
- 3472.2 Filing of qualification statements.
- 3472.2-1 Sole party in interest statement.
- 3472.2-2 Contents of qualification statement.
- 3472.2-3 Signature of applicant.
- 3472.2-4 Special qualifications, heirs, and devisees (estates).
- 3472.2-5 Special qualifications, public bodies.

**Subpart 3473—Fees, Rentals, and Royalties**

- 3473.1 Payments.
- 3473.1-1 Form of payment.
- 3473.1-2 Where paid.
- 3473.1-3 When paid.
- 3473.2 Fees.
- 3473.2-1 General fee provisions.
- 3473.2-2 Exemptions from fee provisions.
- 3473.3 Rentals and royalties.
- 3473.3-1 Rentals.
- 3473.3-2 Royalties.
- 3473.4 Suspension of operation, production, and payment obligations.

**Subpart 3474—Bonds**

- 3474.1 Bonding requirements
- 3474.2 Type of bond required.



# United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
WASHINGTON, D.C. 20240

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- 1 ASD *[initials]*
- IC
- EEO
- 2 P&E *[initials]*
- PA
- Rec
- TS
- NS
- Other
- 5 CFM&L

Memorandum

To: State Director, New Mexico

From: Assistant to the Director for Coal Management

Subject: Application of Unsuitability Criteria to Proposed Camp Swift Lease Area

This is in response to your memorandum of February 25, 1980, discussing procedural problems in the application of unsuitability criteria for Camp Swift.

The following should clarify and resolve some of the specific concerns in dealing with the unsuitability criteria application. Some of these items have also been discussed with Dennis Erhart and Betsy Daniel on your staff.

First of all, the Department of the Interior (DOI), as directed under the Surface Mining Control and Reclamation Act (SMCRA), has the authority for unsuitability assessment of Federal lands. The Department of Army, in the case of Camp Swift, would have to be consulted as the surface management agency as required under appropriate unsuitability criteria. In the context of the coal regulations, the Bureau of Land Management (BLM) is the surface management agency to carry out the review of Federal lands and apply the unsuitability criteria.

Under 43 CFR 3461.3-1(a)(1), where two or more criteria or unsuitability conditions exist the application of exceptions for these criteria is not disallowed if they would allow the affected area to be considered as suitable. The intent of this section of the regulations is to protect areas affected by a criterion that does not have any exceptions contained in its language for areas which are clearly protected by laws, regulations, etc., as being unsuitable. This should clear up the concern you have relating to the electrical transmission line and National Guard training areas if each of the parties either agrees to give permission under Criterion Number 2 exception (iv), or if stipulations can be provided under exception (v) as you recommend.

Criterion Number 3, concerning the Texas National Guard facilities, would allow the exception (iii) to be applied, if written permission is granted by the Department of Army -- their condition not only meets the exception (iii) requirements, but exceeds them from the standpoint of allowing the buildings themselves to be disturbed. If this permission has been granted upon the condition of relocation of the buildings prior to mining, this should be carried through into the lease agreement and so stipulated as a contingency on the lease.

The cemeteries also being considered under Criterion Number 3 can be addressed as you proposed. If the relocation of the four cemeteries occurs prior to leasing consistent with state law, the areas could be reconsidered and determined suitable. This would allow the "larger area" alternative assessed in the environmental impact statement (EIS) to be selected at the time of the decision whether to lease.

Inventories undertaken to assist in determining Criterion Number 7 (Historic Sites) should be assessed to make sure they meet the Class I and II requirements at a minimum. If possible, Class III inventories should be conducted. It should be noted that any future lessee may be required to conduct Class III level inventories on a lease tract which has been inventoried at that level of intensity pursuant to the draft (final anticipated by April 1980) Programmatic Memorandum of Agreement with the Advisory Council on Historic Preservation regarding the Federal coal management program. Consultation must be completed with the Texas State Historic Preservation Officer prior to determination of unsuitability. As you proposed, if the sites are determined unsuitable, the exception may be applied and standard stipulations can be incorporated into the lease agreement for protection.

Application of Criterion Number 14 necessitates an evaluation of the Camp Swift vegetation for regional uniqueness. If the vegetation is regionally unique, then it is to be considered "high priority habitat." If it is not unique, then it is not high priority habitat and a negative determination on Criterion Number 14 would be warranted. After any positive determination on high priority habitat, the Fish and Wildlife Service (FWS) must be consulted to determine if any "migratory birds of high Federal interest" are dependent on this habitat. Specific and detailed guidelines for application of Criterion Number 14 for non-competitive leases and coal lease applications will be provided via a specific instruction memorandum by March 17, 1980.

Application data and formal consultation on Criterion Number 16 (Floodplains) should be completed as required under 43 CFR 3461.3-2. Based on the results of consultation with U.S. Geological Survey (GS) and impact assessment completed with the existing data available, determinations should be made as to the applicability of unsuitability. The exception contained within the language of Criterion Number 16 may be better addressed in the EIS based on further site-specific data availability and continued consultation with GS.

Alluvial Valley floors would be exempt from unsuitability assessment where they are located east of the 100th Meridian as provided by SMCRA, Section 510(b)(5).

We would also like to bring to your attention that after the assessment of unsuitability criteria has been completed a summary report is to be prepared in accordance with 43 CFR 3461.3-3. This report should indicate which criteria and exceptions were applied and the analysis for such decisions. The report should also contain a brief statement which indicates: 1) the potential coal resources involved; 2) the demand for such resources; and 3) the impact of such designation on the environment,

the economy and the supply of coal. You may also refer to previous Instruction Memoranda No. 79-76 and 79-139, as well as 43 CFR Part 3461 for additional guidance.

If you have any questions concerning the discussions outlined in this memorandum or additional concerns relative to the application of the unsuitability criteria on the proposed Camp Swift lease area, please contact Tom Walker, FTS 343-4537, or Lois Mason, FTS 343-6821.



*Bruce Robert*  
Acting



DEPARTMENT OF THE ARMY *Attachment 2*  
OFFICE OF THE ASSISTANT SECRETARY  
WASHINGTON, D.C. 20310

31 AUG 1978

Honorable Cecil D. Andrus  
Secretary of the Interior  
Washington, D. C. 20240

Dear Mr. Secretary:

This is in response to your letter to the Secretary of Defense of 30 May 1978 concerning applications to lease and mine coal deposits within Camp Swift Military Reservation, Texas (your reference 3500 (140)). In accordance with the provisions of Title 30 USC 352, and the authority delegated to the Secretary of the Army by paragraph C5 of DOD Directive Nr. 5160.63, dated 10 August 1978, copy attached, the proposed lease by the Secretary of Interior to the Lower Colorado River Authority and/or the City Public Services Board of San Antonio, in mining lignite at Camp Swift, Texas, is concurred in subject to the following conditions:

- a. Interference with the use of Camp Swift for military purposes (particularly National Guard training) will be held to a minimum.
- b. Any facilities or improvements which will be destroyed by the mining operation must be replaced to the satisfaction of the Adjutant General, Texas, without cost to the State or Federal Government, prior to destruction of existing facilities.
- c. Mining will be done in an orderly manner and the mined area restored promptly to the satisfaction of the Department of Army without cost to the State or Federal Government. Upon completion of restoration, the land will again become available for military purposes.
- d. The scheduling and sequence of areas to be mined will be as agreed to with the Adjutant General, Texas.
- e. The area occupied by mining activities at any given time will be held to a minimum. In no event will it exceed 500 acres.

Honorable Cecil D. Andrus

f. The Environmental Assessment/Statement, Historic and Archeological surveys and any other studies or analysis required will be performed by the Department of Interior without cost to the Department of Army or the State of Texas. Department of Army participation will be limited to providing available information for these studies and reviewing completed studies.

g. The Department of Army and the Texas National Guard will be relieved of all liability for injury or damage which may occur as a result of unexploded ordnance or other dangerous materials within the leased area.

h. The lease holder will comply with safety directives established by the Texas Army National Guard for Camp Swift Military Reservation. Violations of safety directives will result in the lease holder ceasing all operations until the mining operation is in compliance with the safety directives.

It is requested that arrangements be made for representatives from the following offices to participate in lease negotiations:

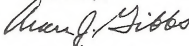
LTC James Starr  
Texas National Guard  
Box 5218  
Austin, Texas 78763  
Telephone: 512-475-5071

Mr. Arthur Graham  
National Guard Bureau  
ATTN: NGB-ARI  
Pentagon Building  
Washington, D. C. 20310  
Telephone: 202-697-8788

Mr. Mike Cottrell  
P.O. Box 17300  
U. S. Army Engineer District, Fort Worth  
Fort Worth, Texas 76102  
Telephone: 817-334-2150

It is further requested that the final draft of the lease be submitted to my office for final approval prior to execution on behalf of the United States.

Sincerely,



Alan J. Gibbs  
Assistant Secretary of the Army  
(Installations, Logistics and  
Financial Management)

Incl  
cy DODD 5160.63,  
10Aug78



August 10, 1978  
NUMBER 5160.63

ASD(MRA&L)

## Department of Defense Directive

**SUBJECT** Delegations of Authority Vested in the Secretary of Defense to Take Certain Real Property Actions

- References:**
- (a) DoD Directive 5160.63, "Authorizing the Secretaries of the Military Department to Take Certain Real Property Actions Vested in the Secretary of Defense," July 6, 1972 (hereby cancelled)
  - (b) Title 10, United States Code, Section 133(d)
  - (c) Title 40, United States Code, Section 319-319c
  - (d) through (h), see enclosure 1

### A. REISSUANCE AND PURPOSE

This Directive reissues reference (a) to delegate additional authorities to the Secretaries of the Military Departments.

### B. APPLICABILITY

The provisions of this Directive apply to the Office of the Secretary of Defense and the Military Departments.

### C. DELEGATIONS OF AUTHORITY

Pursuant to the authority vested in the Secretary of Defense by reference (b), there is hereby delegated to the Secretaries of the Military Departments, with authority to redelegate, the following:

1. The authority vested in the Secretary of Defense by reference (c) to grant easements, to determine the conditions under which easements shall be granted, to relinquish legislative jurisdiction, and to take other actions required in connection with grants.
2. The authority vested in the Secretary of Defense by 40 U.S.C. 345c (reference (d)) to convey interests in real



property, to determine the conditions under which such conveyances should be made to protect the interests of the United States, and to take any other actions required in connection with such conveyances.

3. The authority contained in Public Law 95-101 (reference (e)), and any similar authority provided by future statutes, to determine that it is in the public interest to purchase land or land essements in excess of 100 percent of the value, as determined by the U.S. Army Corps of Engineers or the Naval Facilities Engineering Command. This authority may be used in connection with 42 U.S.C. 4651.(reference (f)).

4. The authority vested in the Secretary of Defense to request the withdrawal of public domain lands pursuant to section 204(d) of Public Law 94-579 (reference (g)) or to grant consent to the Secretary of the Interior to make, modify, or revoke withdrawals pursuant to section 204(i) of Public Law 94-579.

5. The authority vested in the Secretary of Defense by 30 U.S.C. 352 (reference (h)) to consent to mineral leasing by the Secretary of the Interior on lands of the United States, acquired and set apart for military or naval purposes.

D. EFFECTIVE DATE

This Directive is effective immediately.



C. W. DUNCAN, JR.  
Deputy Secretary of Defense

Enclosure - 1  
References

REFERENCES

- (d) Title 40, United States Code, Section 345c
- (e) Section 108(d) of Public Law 95-101, The Military Construction Appropriation Act, 1978, August 15, 1977
- (f) Title 42, United States Code, Section 4651
- (g) Section 204 of Public Law 94-579, The Federal Land Policy and Management Act of 1976 (43 U.S.C. 1714), October 21, 1976
- (h) Title 30, United States Code, Section 352



ADJUTANT GENERAL'S DEPARTMENT

P. O. BOX 5218  
AUSTIN, TEXAS 78763

AGTEX-E

26 August 1980

Mr. John E. Babcock  
Director of Environmental Resources  
Lower Colorado River Authority  
P.O. Box 220  
Austin, TX 78767

Dear Mr. Babcock,

After investigating the methods of lignite mining, the Adjutant General's Department agrees that the following allocation of land area for the mining operation would be acceptable and not have any serious impact on the military training requirements at Camp Swift:

- a. The digging and extraction area would not exceed 300 acres.
- b. Supporting areas would not occupy more than 150 acres.
- c. Areas that have been mined and are undergoing restoration could be as large as 800 acres.

The above determination of types and size of land use is in accordance with the conditions of paragraph d and e set out by Mr. Gibbs, Assistant Secretary of the Interior on 31 August 1978. The actual mining activities would not exceed 500 acres and the restoration area would be available to National Guard use provided that use would not interfere with the restoration process.

The Adjutant General's Department will seek to have the above allocation of land area included in the draft of lignite mining lease.

If there is any question concerning the allocation of land area, please contact this office so that there will not be any misunderstanding concerning the military training requirements of Camp Swift.

A handwritten signature in cursive script, reading "L. James Starr, Jr.".

L. JAMES STARR, JR.  
LTC, CE, TexARNG  
Chief, Facilities & Engineering Branch



STATE DEPARTMENT OF HIGHWAYS  
AND PUBLIC TRANSPORTATION

P.O. BOX 5075  
AUSTIN, TEXAS 78763

ENGINEER-DIRECTOR  
M. G. GOODE

COMMISSION  
A. SAM WALDROP, CHAIRMAN  
DEWITT C. GREER  
RAY A. BARNHART

July 1, 1980

IN REPLY REFER TO  
FILE NO.

Bastrop County  
Control 2190-1  
F.M. 2336

Lignite Lease Application - Camp Swift

State Director  
United States Department of the Interior  
Bureau of Land Management  
New Mexico State Office  
P.O. Box 1449  
Santa Fe, New Mexico 87501

Dear Sir:

Reference is made to your letter of May 23, 1980 regarding the possible relocation of F.M. 2336 if requested by a potential lignite lessee. This Department would be willing to cooperate with the development of these energy resources under the following conditions.

1. The route should be acceptable to the State and County following the public hearing process.
2. The relocated highway will be built to current design standards and at the expense of the lessee.
3. The lessee would be responsible for performing all work subject to our approval. Generally, this would involve the acquisition and clearing of right of way, relocation of displacees, preparation of plans and specifications and award of construction contract.

If we may be of further assistance in this matter, please advise.

Sincerely yours,

A handwritten signature in cursive script that reads "M. G. Goode".

M. G. Goode  
Engineer-Director



# Lower Colorado River Authority

Post Office Box 220 Austin, Texas 78767 AC 512 474-5931

JOHN E. BABCOCK, Director of Environmental Resources

March 28, 1980

Carol Mac Donald, Team Leader  
Environmental Assessment Group  
Bureau of Land Management  
P. O. Box 1449  
Santa Fe, New Mexico 87501

Dear Carol:

This letter is to supplement the one written you on February 8, 1980, with regard to the right-of-way for LCRA's 69 kva electric transmission line which crosses the Camp Swift military reservation and part of which is located within the proposed lignite mining lease area. Reference to the attachments to that letter will show that the 100 foot right-of-way easement is for an aerial easement and does not carry with it any easement on the surface of the land other than the right to place the structures supporting the transmission line.

This is to state that there will be no problem for the Lower Colorado River Authority to relocate the line to an area away from the lease area at a location suitable both to us and to the Department of the Army (the Texas National Guard). As previously pointed out, it is extremely logical that the line would become the source of electric power and energy for any mining operation that would be conducted at Camp Swift. Since Camp Swift is located totally within the electric service area of the Lower Colorado River Authority, it also would be logical that we will be the supplier for electric power and energy to such mining operations. So regardless of who obtains the lease on the lignite, it can be safely assumed that any portions of the line located in the lease area will be relocated so as to prevent interference with the lease areas.

I trust that this provides you the information that you are seeking. If not, please let me know.

Sincerely yours,

John E. Babcock  
Director of  
Environmental Resources



# United States Department of the Interior

1792 (922)

BUREAU OF LAND MANAGEMENT  
NEW MEXICO STATE OFFICE  
P.O. BOX 1449  
SANTA FE, NEW MEXICO 87501

JUL 15 1980

Mr. E. Don Walker  
Chancellor  
The University of Texas System  
601 Colorado  
Austin, Texas 78791

Dear Mr. Walker:

The New Mexico State Office of the Bureau of Land Management (BLM), U.S. Department of the Interior, is processing a hardship coal lease application for approximately 6,740 acres of lignite reserves underlying the Camp Swift Military Reservation in Bastrop County, Texas. The coal lease application area includes 85 acres south of F.M. 2336 which is leased from the Department of the Army (DOA) by the University of Texas System Cancer Research Center. The University of Texas has a five year lease beginning January 1, 1980.

The regulations of the Department of the Interior require BLM to conduct a Federal Lands Review by applying 20 unsuitability criteria and exceptions (43 CFR 3461.1) to all areas proposed for leasing. The purpose of the Federal Lands Review is to identify those areas where conflicting land uses would restrict or prohibit leasing and mining of the coal reserves. If during the review one or more of the criteria are found to apply to an area and no exception (listed after each criterion) permits leasing, then the area must be considered unsuitable for surface coal mining operations and excluded from any lease which is issued.

BLM had identified two conditions which make the area leased by the University of Texas from the DOA unsuitable for mining, unless exceptions may be applied. (A copy of the two applicable unsuitability criteria are enclosed.) The University of Texas lease qualifies under Criterion No. 2 as a surface lease issued for public purposes. It also qualifies under Criterion No. 6 as federal land, under permit, being used for scientific studies. An exception to Criterion No. 2 permits leasing if the parties involved agree in writing. Criterion No. 6 allows mining if written concurrence is given by the "scientific user." Therefore, mining of the Cancer Research lease area on Camp Swift could not occur unless written permission were given by appropriate University of Texas System authorities.

The potential exists for a mutually acceptable arrangement between the lessee for the lignite reserves, BLM, DOA, and the University of Texas System. One possibility would be to exchange the area presently being leased for the Cancer Research Center with another suitable area on the reservation but outside the mining application area. Stipulations attached to the lignite lease could require the lessee to reconstruct or relocate the Cancer Research Center's present

facilities to the new lease area. Another possibility would be to require the lignite lessee to provide an acceptable area outside Camp Swift for lease by the University of Texas.

In consideration of the previous discussion, we are requesting an indication of whether University of Texas System authorities would (or would not) agree to relinquish the Cancer Research Center's present lease area on Camp Swift providing that satisfactory agreements are reached between the parties involved. In addition, if the University of Texas is agreeable to relinquishing the tract, please let us know what conditions would be attached to your consent. Since BLM is processing the lignite lease application and required environmental impact statement according to a "tight" schedule we would appreciate your response as soon as possible.

If you have any questions about the above issues, please call Carol MacDonald at (505) 988-6214. Ms. MacDonald is the Team Leader for the environmental impact statement being prepared on the proposed Camp Swift leasing action.

Thank you for your cooperation.

Sincerely yours,



Bill M. King  
State Director

cting

1 Enclosure  
Encl. 1-Unsuitability Criteria

cc:  
DM, Roswell District  
Real Estate Division, Corps of Engineers  
Fort Worth District, DOA



# United States Department of the Interior

Attachment 6

OFFICE OF SURFACE MINING  
Reclamation and Land Management  
818 Grand Avenue, Scarsuit Building  
KANSAS CITY, MISSOURI 64106

June 18, 1980

Mr. Arthur W. Zimmerman  
State Director  
Bureau of Land Management  
New Mexico State Office  
P.O. Box 1449  
Santa Fe, New Mexico 87501

Dear Mr. Zimmerman:

This is in response to your letter of May 23, 1980, in which you requested clarification of the OSM process to relocate a section of public road FM 2336 at Camp Swift, Texas. The road is located in the area encompassed by Federal coal lease application NMA 29640 (Texas).

Contrary to the exception (ii) to unsuitability criterion No. 3, OSM has no authority to issue a permit to relocate a road on Federal lands prior to leasing by BLM. The OSM permitting process begins after a Federal coal lease has been issued and the leasee files a mining/reclamation plan (MRP) and a permit application on the lease area. Road relocation must be part of the mining operation covered in the MRP and permit application.

The MRP will cover the expected life of surface coal mining operations on the lease area. The plan will be reviewed by the Regional Office and a recommendation forwarded to OSM, Washington. After a recommendation by OSM, it will be approved, disapproved, or conditionally approved by the Secretary.

Permits to conduct surface coal mining and reclamation operations on Federal lands in accordance with an approved MRP are approved by the Director of OSM after review by the Regional Office.

The state regulatory authority (SRA) will be involved in the review and recommendation process if there is an approved state/Federal cooperative agreement authorizing state regulation of surface coal mining on Federal lands. Both the MRP and permit review may be done concurrently.

During the MRP/permit review process, OSM and the SRA will follow the procedures under 30 CFR 761.12(d)(1)-(4). These procedures are self-explanatory, and a copy is attached for your information.

U.S. DEPARTMENT OF THE INTERIOR

Date Routed:  
**JUN 23 1980**

1 SD *[Signature]*

     ASD *[Signature]*

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     EECO

2 P&EC *[Signature]*

     PA

3 Res

4 TS

     MS


5 CFM&L



2

I hope this will clarify the OSM process for permitting road relocation.  
If you have further questions, please call Ray Brubaker at FTS-758-3920.

Sincerely,



Handwritten signature of Allyn O. Locker in cursive script.

ALLYN O. LOCKER  
Acting Regional Director

Enclosure



Attachment 7  
IN REPLY REFER TO:  
3501 (14)

# United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
WASHINGTON, D.C. 20240

March 17, 1980

Instruction Memorandum No. 80-371  
Expires 9/30/81

To: SD's - Colorado, Montana, New Mexico, Utah, Wyoming; and D-ESD  
From: Assistant to the Director for Coal Management  
Subject: Coal Unsuitability Criteria Guidelines

This memorandum provides guidelines for the coal unsuitability criteria consultation procedures for non-wildlife related criteria. Wildlife related criteria guidelines are presented by a separate instruction memorandum (IM80-346). These guidelines are to be applied for any future initiation of unsuitability criteria assessments. They need not be applied where an unsuitability study is on-going and other consultation procedures have been followed nor where an unsuitability determination has been completed.

Those non-wildlife unsuitability criteria which require consultation with, concurrence from, or a decision by another party are listed below, followed by a brief description of the procedures for fulfilling the Bureau of Land Management's (BLM's) consultation requirements. Guidelines on how to use the information obtained during consultations or how to apply the criteria are not presented in this memorandum since this would essentially duplicate the procedures set out in 43 CFR Subpart 3461.

Criterion 1: In order to apply item (i)(B) of this criterion's exception, a determination of significant forest cover by the Secretary of Agriculture is mandatory. This determination can be done as part of the National Forest Service's (FS's) land use plans where FS coal lands are involved. If this exception is to be applied, a letter from the appropriate BLM District Manager (or appointee) to the appropriate National Forest Supervisor, which is sent shortly after a mutual BLM/FS decision to consider coal leasing on FS lands, can remind FS of mandatory determinations. The necessity for such a reminder warrants the discretion of the appropriate District Manager. Otherwise, the application of this aspect of this exception depends on the discretion of the FS.

Criterion 2: In order to apply item (iv) of this criterion's exception, a written agreement from the parties involved in a right-of-way easement is mandatory. Such an agreement, if desired, should be requested by letter from the BLM District Manager (or appointee) whose area of jurisdiction involves the subject right-of-way.

Criterion 3: In order to apply item (ii) of this criterion's exception, a public road relocation permit issued by the Office of Surface Mining Reclamation and Enforcement (OSM) is mandatory. If this exception is to be applied, the BLM District Manager (or appointee) whose area of jurisdiction involves the subject right-of-way should request via letter to the appropriate Regional Director of OSM whether such a permit has been issued or warrants future issuance.

In order to apply item (iii) of this criterion's exception, written permission from occupied building owners to mine within 300 feet of their buildings is mandatory. Such permission, if desired, should be requested by letter by the BLM District Manager (or appointee) whose area of jurisdiction involves the subject buildings.

Criterion 6: The application of this criterion may warrant written concurrence of the principal scientific user of the Federal lands under permit for scientific studies. If such permission is desired as part of the application of this criterion, it should be requested by letter by the BLM District Manager (or appointee) whose area of jurisdiction involves the subject scientific study area.

Criterion 7: In order to apply either this criterion or its exception, consultation with both the Advisory Council on Historic Preservation (ACHP) and the appropriate State Historic Preservation Officer (SHPO) is required. The BLM District Manager (or appointee) whose area of jurisdiction involves the subject cultural resources should conduct these consultations via letter. Consultations with the ACHP and the SHPO should consist of written notification of areas of potential Federal coal leasing and the inventory results during land-use planning and activity planning. Additional consultations with the SHPO may be desired but they are not mandatory.

Criterion 8: In order to apply item (1) of this criterion's exception, the concurrence of the state on a natural area's regional or local significance is required. If this aspect of the exception merits consideration, the State Director whose area of jurisdiction involves the subject site should request via letter the concurrence of the appropriate State Governor. If the State Governor delegates his or her concurrence authority, the BLM State Director may delegate an appropriate BLM person to consult with that state appointee for any on-going or future Criterion 8 endeavors.

Criterion 16: In order to apply this criterion, consultations with the Geological Survey (GS) are required if the Federal lands involve riverine, coastal, and special floodplains (100-year recurrence interval). These consultations are to assist the surface management agency to determine if "all or certain stipulated methods of coal mining can be undertaken without substantial threat of loss to people or property, and to the natural and beneficial values of the floodplain on the lease tract and downstream". Accordingly, the BLM District Manager (or appointee) whose area of jurisdiction involves such Federal lands should send a letter to the appropriate district-level manager of GS's water resources' office. This letter should request his or her opinion on whether all or certain

stipulated methods of coal mining can proceed in the above-quoted manner. A reminder of the 30-day time provision contained in 43 CFR 3461.3-2 may be appropriate in this situation.

Criterion 17: In order to implement item (i) of this criterion's exception, written concurrence from the municipality or the responsible governmental unit is mandatory. If this aspect of the exception is to be applied, the BLM District Manager (or appointee) whose area of jurisdiction involves the subject governmental unit is to request, via letter, the written concurrence of the mayor (or appropriate counterpart if a mayor does not exist) of that governmental unit.

Criterion 18: This criterion involves National Resource Waters (NRW's) as identified by states in their water quality management plans. Prior to the application of this criterion, the BLM State Director whose area of jurisdiction involves existing or potential NRW's should (1) obtain the latest version of a state's water quality management plan and (2) request, via letter to the State Governor, information concerning any anticipated changes to the NRW's cited in the water quality management plan.

Criterion 19: In order to apply this criterion, consultation with the State is necessary to assist in the identification of alluvial valley floors. These consultations should be conducted by a letter to the State Governor's office from the BLM State Director whose area of jurisdiction involves the application of this criterion. This letter should request data on which areas constitute alluvial valley floors. If the State Governor refers the BLM to a state person or agency of particular expertise, the State Director may appoint a BLM person to pursue any on-going or future Criterion 19 consultations.

Criterion 20: No BLM State Office or District Office consultations are required to identify state proposed unsuitability criterion, because any such proposals should be initiated with the Secretary by a state. If, however, the Secretary adopts a state proposed criterion, state consultations are required in order to apply item (ii) of this criterion's exception. Consultations on this exception should be by letter to the State Governor from the BLM State Director whose area of jurisdiction is involved. The nature of this consultation would be dependent on the nature of the state proposed and Secretarial adopted criterion.

It should be noted that 43 CFR 3461.3-1(a)(2) calls for an additional cumulative consultation process on all unsuitability criterion findings. Basically, this section calls for the authorized officer to invite public comment on all criteria and exception findings, including wildlife and non-wildlife related criteria. This general public consultation is to be accomplished by notice published in the Federal Register and a newspaper of general circulation in the subject area. It is to be published at the criteria and exception application phase of land-use planning and in accordance with the specific details contained in 43 CFR 3461.3-1(a)(2).

*Tom Walker*  
Acting



# United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
WASHINGTON, D.C. 20240

IN REPLY REFER TO:

3501 (162)

July 30, 1980

Instruction Memorandum No. 80-371, Change 1  
Expires 9/30/81

To: SD's - Colorado, Montana, New Mexico, Utah, Wyoming; and ESD

From: Director

Subject: Coal Unsuitability Guidelines

This memorandum transmits three changes to Instruction Memorandum No. 80-371.

- (1) Add the following two sentences to the end of the paragraph on Criterion 2:

This written agreement need not be absolute due to the uncertainties of potential coal operations, but must indicate the parties' acceptance of at least some form of operations within the unsuitable area. In addition, if the involved parties have already expressed a form of written agreement in another document (e.g. a transportation plan, previous correspondence), then the District Manager need not pursue any further consultations to apply this exception.

- (2) Add the following sentence to the end of the last paragraph on Criterion 3:

This written permission need not be absolute due to the uncertainties of potential coal operations, but must at least indicate the type(s) of mining which the owner(s) of the occupied buildings would find permissible, should the land be leased and mined.

- (3) The first sentence of the paragraph on Criterion 16 should be replaced by the following three sentences:

In applying this criterion, consultations with the Geological Survey (GS) may be desired but are not necessarily required. If the Bureau's District or State Offices decide that "Federal lands are in riverine, coastal, and special floodplains (100 year recurrence interval)," these lands can be considered unsuitable at this point and no further consultations with GS are necessary. However, if at this point, the Bureau's District or State Offices desire to consider such a floodplain to be suitable, then GS consultations are required.

Date Routed:

AUG 4 1980

|       |                   |
|-------|-------------------|
| SD    | <i>[initials]</i> |
| ASD   | <i>[initials]</i> |
| IC    | <i>[initials]</i> |
| EEOO  | <i>[initials]</i> |
| P&EC  | <i>[initials]</i> |
| PA    | <i>[initials]</i> |
| Res   | <i>[initials]</i> |
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| MS    | <i>[initials]</i> |
| CFM&L | <i>[initials]</i> |

*Bob Moore*

Assistant to the Director  
for Coal Management



TEXAS HISTORICAL  
COMMISSION

TRUETT LATIMER  
EXECUTIVE DIRECTOR

P. O. BOX 12276  
AUSTIN TEXAS 78711

July 2, 1980

Mr. Arthur W. Zimmerman  
State Director  
U.S. Department of the Interior  
Bureau of Land Management  
New Mexico State Office  
P.O. Box 1449  
Santa Fe, New Mexico 87501

RE: Camp Swift Military Reservation  
Bastrop County, Texas  
Proposed leasing of 6740 acres of  
federally owned lignite  
Management of Cultural Resources and a  
determination of eligibility

Dear Mr. Zimmerman:

We have had the opportunity to review the above-referenced project with Dr. Levine on July 1 and 2, concerning the management of cultural resources to be affected by the proposed surface mining. Accordingly, we offer the following recommendations pursuant to the preparation of a determination of eligibility, and if appropriate a subsequent Memorandum of Agreement:

- 1) While none of the sites appear to individually possess great scientific value, as a group they reflect a pattern of human usage through time. They contain information important to an understanding of prehistory and early history in an area that has received little professional study and accordingly, we suggest the sites be considered eligible for inclusion in the National Register of Historic Places using this criterion. We believe that they could be determined eligible as a Multiple Resource Area.
- 2) Given an appropriate mitigation program to recover the data sets contained therein, we feel that there are no lands in the project area given the criteria for unsuitability, unsuitable for mining.
- 3) We have reviewed the archeological inventory "A Cultural Resource Inventory and Assessment at Camp Swift, Texas", as prepared by Texas Archeological Survey and find it adequate as a partial inventory.

*The State Agency for Historic Preservation*

- 4) The management plan (mitigation strategy) should integrate prehistoric and historic resources such that they can be utilized to produce a human history of the area.
- 5) There appears to be little or no architectural significance within the project area but historic settlements, farm complexes and features should be investigated through detailed recording and ethnohistoric research.
- 6) It is our understanding that the Bureau of Land Management has a Programmatic Memorandum of Agreement concerning surface mining. We should jointly review it and determine if it is appropriate to prepare a site specific Memorandum of Agreement for signature by the applicant, the Texas SHPO and the BLM.
- 7) During the prosecution of the mining, we request that additional surveying be conducted during clearing activities to locate sites which may be present in the Dogwood Branch Creek Area and the area marked "Old Fort"
- 8) Study units in the project area which might be included in the management plan for selected sites include site settlement, cultural change, analysis of material culture, subsistence, site-function, demography, and ethnoarcheology.
- 9) A cultural resources management plan consistent with the above concerns would, if implemented, result in a project with no adverse effects on cultural resources.
- 10) Respectfully request that Sites within the Camp Swift Military Reservation which will not be affected by mining activities should be protected and preserved by avoidance.

We appreciate the opportunity to participate with the project archeologist and the Bureau of Land Management concerning this important project. If we can be of further assistance, please advise.

Sincerely,

Truett Latimer  
State Historic Preservation Officer

by

  
Alton K. Briggs  
Director  
Review and Compliance - Federal Projects

AKB/lft

Enclosure (1) DofE

6040 (931)

FEB 1 1980

Memorandum

To: Regional Director, USFWS, Region 2, Albuquerque, New Mexico  
From: State Director, BLM, Santa Fe, New Mexico  
Subject: T/E List Request for Camp Swift Lignite Coal Lease Area, Texas

Relative to the November 10, 1978 Amendment to the 1973 Endangered Species Act, the Bureau of Land Management has determined that the proposed actions of the Camp Swift Lignite Coal Lease would be a "major construction" action. A brief description of the proposed action and alternatives and maps are enclosed.

This is a formal request for a list(s) of threatened and endangered species (plants and animals) and any species proposed for listing which may occur within the considered area.

If there are any questions, please contact Lee Upham, New Mexico State Office, Endangered Species Coordinator (phone FTS-476-1234).

/S/ Larry L. Woodard

Enclosure

Antjag

cc:  
P&MC  
LUpnam





UNITED STATES  
DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE

POST OFFICE BOX 1306  
ALBUQUERQUE, NEW MEXICO 87103

February 15, 1980

Attachment 9a  
IN REPLY REFER TO:

Date Routed:

FEB 20 1980

ASST. DIR. \_\_\_\_\_  
M.D. \_\_\_\_\_  
B.D. \_\_\_\_\_  
H.W. \_\_\_\_\_

SD \_\_\_\_\_  
ASST. \_\_\_\_\_  
IC \_\_\_\_\_  
EBOO \_\_\_\_\_  
P&FC \_\_\_\_\_  
PA \_\_\_\_\_  
Res. oil \_\_\_\_\_  
TS \_\_\_\_\_  
MS \_\_\_\_\_  
BOM&L \_\_\_\_\_

MEMORANDUM

TO : Arthur W. Zimmerman, State Director, Bureau of Land Management - Other \_\_\_\_\_  
New Mexico State Office, P.O. Box 1449, Santa Fe, New Mexico - BOM&L \_\_\_\_\_

FROM : Regional Director, Region 2 (SE)

SUBJECT: Species List for Camp Swift Lignite Coal Lease Area, Texas

This is in reply to your February 1, 1980 letter which requested information about species which are listed or proposed to be listed as threatened or endangered as provided by the Endangered Species Act. Your area of interest is Camp Swift Lignite Coal Lease Area, Bastrop County, Texas.

As provided by Section 7(c) of the Endangered Species Act Amendments of 1978, the Fish and Wildlife Service is required to furnish a list of those species, both proposed and listed, that may be affected by Federal construction activities.

Upon receipt of the Fish and Wildlife Service's species list, the Federal agency authorizing, funding, or carrying out the construction action is required to conduct a biological assessment for the purpose of identifying listed species which are likely to be affected by such action. Proposed species are included on the list even though they do not have legal protection under the Act. Their inclusion recognizes that they may be listed anytime and have the portent to cause delays or modifications to the proposed action. In light of this, we recommend that those species be included in the biological assessment.

Sept 17th

The biological assessment shall be completed within 180 days after receipt of the species list, unless it is mutually agreed to extend this period. The biological assessment should include: 1) the results of a comprehensive survey; 2) results of any studies undertaken to determine the nature and extent of any impacts on identified species; 3) consideration of the cumulative effects upon the species or its critical habitat; 4) study methods used; 5) difficulties encountered in obtaining data and completing the proposed study; 6) conclusions including recommendations

as to further studies, and 7) any other relevant information.

For purposes of providing interim guidance, the Fish and Wildlife Service considers construction projects to be any action conducted or contracted by the Federal agency designed primarily to result in the building or erection of man-made structures, such as dams, buildings, roads, pipelines, and the like. This includes consideration of major Federal actions such as permits, grants, licenses, or other forms of Federal authorization or approval which may result in construction and which significantly affect the quality of the human environment. In addition, other actions that have the potential of becoming or are controversial, may be considered as construction.

If the biological assessment reveals that the proposed project may affect listed species, the formal consultation process shall be initiated by writing to the Regional Director, Region 2, U.S. Fish and Wildlife Service, P.O. Box 1306, Albuquerque, New Mexico 87103. If no affect is evident, there is no need for further consultation. We would, however, appreciate the opportunity to review your biological assessment.

The attached sheets provide information on species which may occur in the proposed project area. If we may be of further assistance, do not hesitate to call upon us (505-766-3972; FTS 474-3972).



Attachments

cc: Austin Area Office (SE), Austin, Texas  
OBS, Region 2  
Ecological Services Field Office, Albuquerque, New Mexico

Camp Swift Lignite Coal Lease Area  
Bastrop County, Texas

LISTED SPECIES

1) Bald eagle (Haliaeetus leucocephalus) - Large raptor (6 1/2-8 foot wing-span), adults distinctive with white heads and tails. Immature plumage similar to golden eagle. Once widespread in riparian areas of the southwest, but never abundant as southwest is peripheral range. Currently, nests in southeast and coastal Texas, central Arizona along Salt and Verde rivers, New Mexico near Gila National Forest and eastern Oklahoma. Migrants from northern states congregate around large bodies of water in winter, primarily in Oklahoma and Texas with a few occurring in Arizona and New Mexico. Tolerance of human disturbance varies. Communal roost trees sometimes used in winter. Opportunistic predators and scavengers, taking fish, carrion, crippled waterfowl, and occasionally turtles and small mammals. Hunt while flying or from perches.

2) Houston Toad (Bufo houstonensis) - Small (2-2 1/2" long) and secretive, seldom seen outside the breeding season and most easily distinguished from other species of toads in area by the distinctive mating call, a high-pitched trill. Tadpoles easier to identify than adults. Now restricted to Bastrop, Burleson, and possibly Harris counties; extirpated from historic range in Liberty, Fort Bend, Austin, and Colorado counties. Requires loose sandy or sandy loam soils often on ridges of prairie or loblolly pine (Pinus taeda) woods, where it burrows and estivates much of the year. Breeding season, February-June, initiated by heavy rains and warm nights. Males arrive first at temporary pools to call females. Tadpoles hatch in a few days, feed on algae, transform to toads in 4-6 weeks, then disperse. Captive propagation at Houston Zoo and other laboratories. Critical habitat declared in Bastrop and Burleson counties.

Major threats: Loss of habitat due to altered drainage, land clearing, and development; hybridization with Gulf Coast toad (B. valliceps) and Woodhouse toad (B. woodhousei).

Key Habitat Features: Loose sandy soil and temporary water.

3) American alligator (Alligator mississippiensis) - Originally found in coastal plain and major stream valleys from North Carolina to Texas. May also have crossed Rio Grande River into Tamaulipes, Mexico. Occur in reduced numbers throughout original range. Almost any wet habitat will support some individuals; optimum habitats are large shallow lakes and sluggish rivers, fresh and brackish marshes, and wet savannas of coastal

zone. Stable water levels are important for good hatching success. Take refuge from danger and cold weather in deep dens ("gator holes") in banks or in marshes; these are often characterized by lush plant growth. Twenty-sixty laid in a nest mound of vegetation during May-June; where not harassed by man, females may guard nest until August-September hatching. "Pod" of newly hatched young remain together for months. In good habitat, may reach minimum breeding size of 6' in 5-7 years.

High reproductive potential and wide ecological tolerance enable it to recover rapidly with protection. Future outlook still uncertain in rapidly developing areas.

#### PROPOSED SPECIES

None.

#### CRITICAL HABITAT

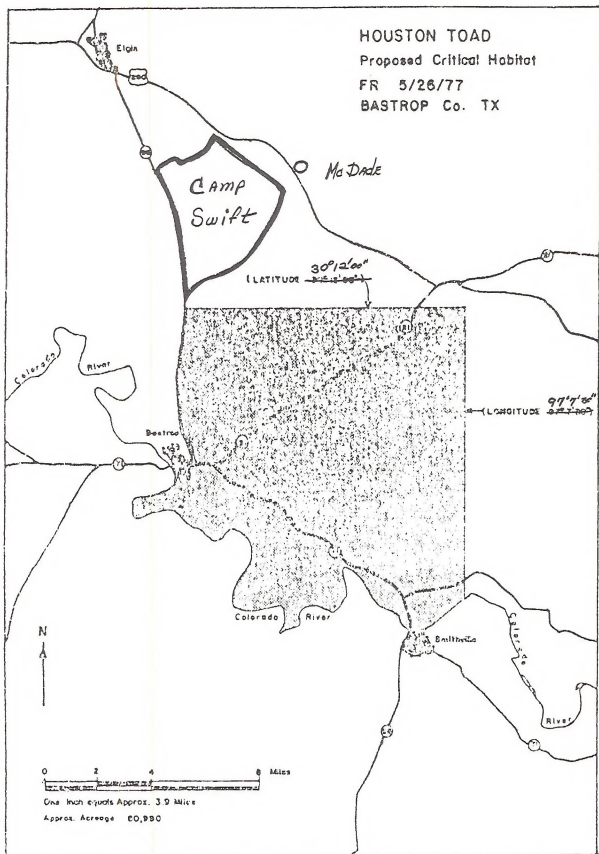
Houston toad in Bastrop and Burleson County. See attached description.

HOUSTON TOAD

Proposed Critical Habitat

FR 5/26/77

BASTROP Co. TX



JUN 19 1980

Mr. Charles D. Travis  
Executive Director  
Texas Parks and Wildlife Department  
4200 Smith School Road  
Austin, Texas 78744

Dear Mr. Travis:

As you know, the New Mexico State Office (NMSO) of the Bureau of Land Management (BLM), U.S. Department of the Interior, is processing a hardship coal lease application for approximately 6,740 acres of lignite reserves underlying the Camp Swift Military Reservation in Bastrop County, Texas. (See attached map.)

On June 1, 1979, the Secretary of the Interior issued the final approved criteria for designating lands unsuitable for all or certain stipulated methods of mining involving surface coal mining operations on federal lands. The regulations of the Department of the Interior require that, before leasing, BLM conduct a Federal Lands Review by applying 20 unsuitability criteria and exceptions (43 CFR 3461.1) to all areas proposed for leasing. The purpose of the Federal Lands Review is to identify those areas where conflicting land uses would restrict or prohibit leasing and mining of the coal reserves. If during the review one or more of the criteria are found to apply to an area and no exception (listed following the criterion) permits leasing, then the area must be considered unsuitable for surface coal mining operations and excluded from any lease which is issued. In several of the criteria, the Bureau of Land Management is instructed to consult with the Fish and Wildlife Service (FWS) and the state that is directly involved related to fish and wildlife resources. (A copy of the 20 unsuitability criteria, with those criteria related to fish and wildlife marked in red, is attached.)

To carry out specific procedures that apply to coordination for each wildlife related unsuitability criterion, we are requesting the following information on criteria No. 10 and No. 15 to be applied as guidelines during preparation of our environmental statement and unsuitability analysis report:

#### Information Needs

Criterion 10: Federal lands containing habitat determined to be critical or essential for plant or animal species listed by a state pursuant to state law as endangered or threatened shall be considered unsuitable. (See enclosure I.)

1. A species listing of legislatively protected state threatened or endangered (T&E) plant and/or animal species which are known or potentially occur on Camp Swift Military Reservation.

2. A map identifying habitats known or suspected of being "essential or critical" (as discussed under criterion 10 in enclosure I) to the above listed state T&E species on Camp Swift.

Note: If the state list of T&E species also includes federally listed species, please note and differentiate between those species in your discussion.

Criterion 15: Federal lands which the surface management agency and the state jointly agree are fish and wildlife habitat for resident species of high interest to the state and which are essential for maintaining these priority wildlife species shall be considered unsuitable. (See enclosure I for examples.)

1. A listing of resident wildlife species (can include game, non-game, upland or aquatic species) which the state feels to be of high interest, as defined under criterion 15, which occur on Camp Swift Military Reservation.

2. A map identifying habitats which are essential for maintaining those high interest species listed above, on Camp Swift.

Note: Only the "most" essential or critical habitats should be identified.

It is important to stress the need for your involvement at this stage of the coal unsuitability criteria process. I would also like to take this opportunity to thank Mr. Floyd Potter from your staff for all of the cooperation and information he has provided concerning the Camp Swift and Bastrop County area. Because of the constricted time frame to complete the EIS, we are requesting a response from your agency within 30 days from receipt of this letter.

Thank you for providing us with this information. If you have any questions please contact Jaime Provencio, NMSO, Santa Fe at (505) 988-6468.

Sincerely yours,

*14/ Larry L. Woodard*  
Associate State Director

Enclosure

cc:  
Mr. J. Russell Mase

922:JProvencio:es:6/16/80:x468

Attachment 10a

TEXAS  
PARKS AND WILDLIFE DEPARTMENT



CHARLES D. TRAVIS  
EXECUTIVE DIRECTOR

4200 Smith School Road  
Austin, Texas 78744

COMMISSIONERS  
PERRY R. BASS  
Chairman, Fort Worth  
JAMES R. PAXTON  
Vice Chairman, Palestine  
PEARCE JOHNSON  
Austin

COMMISSIONERS  
JOE K. FULTON  
Lubbock  
EDWIN L. COX, JR.  
Dallas  
W. B. OSBORN, JR.  
Santa Elena

July 17, 1980

Mr. Larry L. Woodard, State Director  
U. S. Department of the Interior  
Bureau of Land Management  
New Mexico State Office  
Post Office Box 1449  
Santa Fe, New Mexico 87501

Re: Request for Information Concerning  
Proposed Mining at the Camp Swift  
Military Reservation, Bastrop County, Texas

Dear Mr. Woodard:

Concerning your request for information pertaining to both Criterion 10 and 15, the following information is provided.

Criterion 10: Under the designations of "essential" or "critical" habitat, none is known to occur within the boundaries of Camp Swift. With respect to the state listed species (endangered or protected nongame), Camp Swift constitutes only a very small fraction of the distributions of those species known to be or suspected of being found there. Therefore, considering only Camp Swift, little adverse impact on any state-listed species is anticipated. Designated "critical habitat" for the Houston toad is nearby, but Houston toads are not currently known to occur on Camp Swift.

Criterion 15: There are no state species which would meet the requirements of this criterion.

I appreciate the opportunity to review and comment on this matter.

Sincerely,  
  
CHARLES D. TRAVIS  
Executive Director

CDT:RWS:dsb





United States Department of the Interior

GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION  
FEDERAL BUILDING  
300 EAST 8TH STREET  
AUSTIN, TEXAS 78701

May 14, 1980

Attachment II

Date Routed: MAY 10 1980

1 SD *[initials]*  
ASD \_\_\_\_\_  
IC \_\_\_\_\_  
EEOO \_\_\_\_\_  
2 P&EC *[initials]*  
PA \_\_\_\_\_  
~~Res~~ \_\_\_\_\_  
TS \_\_\_\_\_  
MS \_\_\_\_\_  
3 CPK:el \_\_\_\_\_

Memorandum

To: State Director, Bureau of Land Management, New Mexico

From: District Chief, USGS, WRD, Austin, Texas

Subject: Application of Unsuitability Criterion Number 16 to the Area of Hardship Coal Lease Application NM A-29640, Texas (Camp Swift Military Reservation, Bastrop County, Texas)

In response to your memorandum of April 15, 1980, on the above subject, mining will not cause substantial threat of loss to people or property, and to the natural and beneficial values of the floodplains on the lease tract and downstream, if the mined area is restored by reclamation to the general topography now existing.

As you are probably aware the Water Resources Division, USGS, began a USGS-funded hydrologic study of the Camp Swift area in fiscal year 1979. The objective of the study is to collect and analyze hydrologic data to determine the effects of strip-mining and associated operations on the various components of surface and ground-water systems. The first phase is to appraise quantitatively the ground-water and surface-water resources prior to mining operations, including a determination of seasonal variations in the organic, inorganic, and sediment characteristics of surface runoff, and the areal variations in quality of ground water.

Stream-gaging stations in the study area have not been operated for a sufficient length of time to develop flood-frequency relations. Therefore, we are enclosing a copy of the most recent state-wide flood-frequency report, "Technique for Estimating the Magnitude and Frequency of Floods in Texas." The equations presented in this report should provide the basis for the most reliable estimates available for ungaged, unregulated rural streams in Texas.

If additional assistance is required, please advise.


Sincerely yours,

I. D. Post

IDY:fsp  
Encl.

I hope this will clarify the OSM process for permitting road relocation.  
If you have further questions, please call Ray Brubaker at FTS-758-3920.

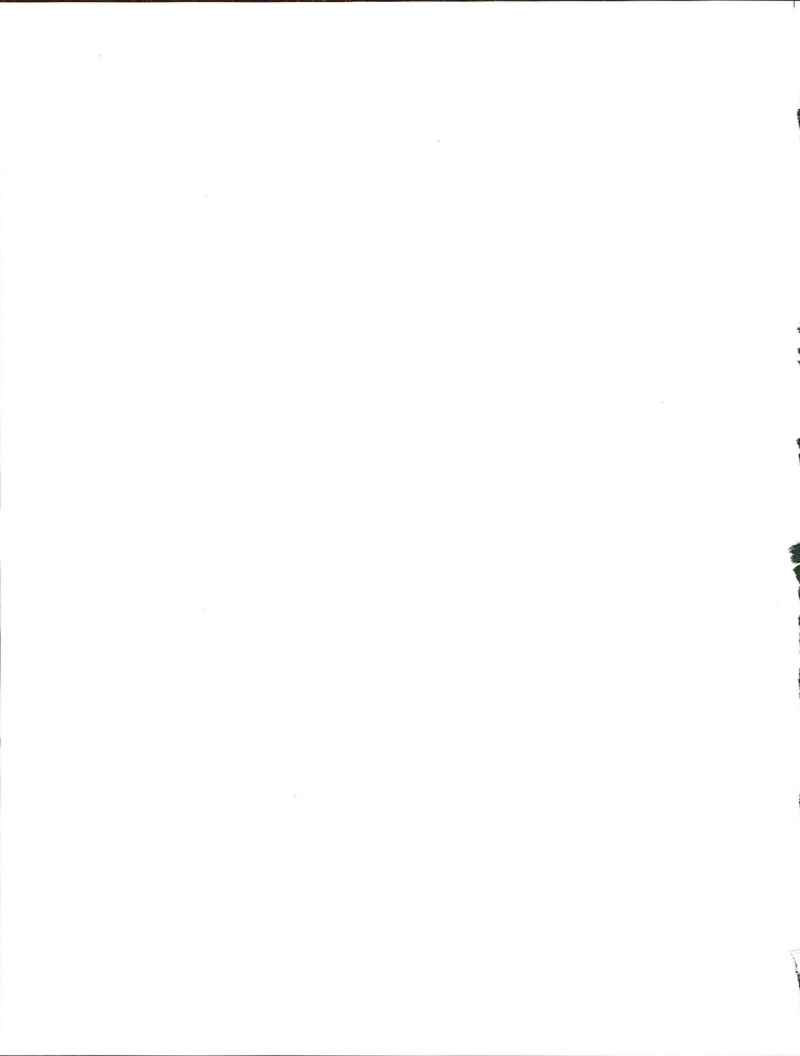
Sincerely,



ALLYN O. LOCKNER  
Acting Regional Director

Enclosure

APPENDIX 2  
BLM STANDARD LEASE  
STIPULATIONS



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

SERIAL NUMBER \_\_\_\_\_  
DATE OF LEASE \_\_\_\_\_

COAL LEASE

\_\_\_\_\_

This lease between the United States of America (the lessor) through the Bureau of Land Management (BLM) and

(lessee) is readjusted, effective as of \_\_\_\_\_.

Sec. 1. STATUTES AND REGULATIONS. This lease readjustment is subject to the terms and provisions of the Mineral Leasing Act of February 25, 1920, as amended (41 Stat. 437, 30 U.S.C. §§ 181-263), hereinafter referred to as the Act, and of the Surface Mining Control and Reclamation Act of 1977. This lease is also subject to all regulations of the Secretary of the Interior (including, but not limited to, 30 CFR Part 211 and 43 CFR Group 3000) and to all regulations of the Secretary of Energy promulgated pursuant to Section 302 of the Department of Energy Organization Act which are now or hereafter in force and which are made a part hereof. No amendment to the regulations made subsequent to the effective date hereof shall alter the rental and production royalty requirements in sections 5 and 6 of this lease until the next readjustment of this lease.

Sec. 2. RIGHTS OF LESSEE. The lessor, in consideration of the rents and royalty and other conditions hereinafter set forth, hereby grants to the lessee the exclusive right and privilege to mine and dispose of all coal in the following-described tracts (lease lands) situated in the State of \_\_\_\_\_:

containing \_\_\_\_\_ acres, more or less, together with the right to construct all work, buildings, structures, equipment, and appliances which may be necessary and convenient for the mining and preparation of the coal for market, and subject to the conditions herein provided, to use so much of the surface as may reasonably be required in the exercise of the rights and privileges herein granted for so long as this lease remains in full force and effect under any provisions of the law and the applicable regulations thereunder.

Sec. 3. DILIGENCE. The lessee shall engage in the diligent development of the coal resources subject to the lease by timely preparation for and initiation of production of coal from this lease or from the Logical Mining Unit (LMU) of which this lease is a part so that coal is actually produced in commercial quantities before June 1, 1986, except that the period of time during which production of coal in commercial quantities must be achieved may be extended as provided in the regulations (43 CFR 3475.4). After diligent development is achieved, the lessee shall maintain continued operation of the mine or mines on the leased lands as defined in the regulations.

Sec. 4. BOND. The lessee shall file with the appropriate BLM office a lease bond in the amount of \_\_\_\_\_ for the use and benefit of the United States, to insure payment of rentals and royalties and to insure compliance with all other terms of this lease, the regulations and the Act. An increase in the amount of the bond may be required by the lessor at any time during the life of the lease to reflect changed conditions.

Sec. 5. RENTAL. An annual rental of \_\_\_\_\_ for each acre or fraction thereof shall be paid in advance on or before the anniversary date of this lease. Rentals under this lease shall be payable for each and every year during the continuance of the lease. Rentals paid for any year prior to this readjustment shall be credited against the royalties for that year. Rentals due and payable on and after the lease year commencing on the effective date of this readjustment may not be credited against royalties (43 CFR 3473.3-1).

Sec. 6. PRODUCTION ROYALTY. The lessee shall pay a production royalty of \_\_\_\_\_ percent of the value of coal produced by strip or auger mining methods and \_\_\_\_\_ percent of the value of coal produced by underground mining methods. The value of coal shall be determined as set forth in the regulations. Production royalties paid for a calendar month shall be reduced by the amount of any advance royalties paid under this lease to the extent that such advance royalties have not been used to reduce production royalties in a previous month. Production royalties shall be payable the final day of the month succeeding the calendar month in which coal is mined.

Sec. 7. ADVANCE ROYALTY. Upon request by the lessee the mining Supervisor may accept, for a total of not more than ten years, the payment of advance royalties in lieu of the condition of continued operation for any particular year. Any payment of advance royalties in lieu of continued operation shall be pursuant to an agreement, signed by the lessee and the Mining Supervisor, which shall be made a part of this lease. The agreement shall include a schedule of payments and shall be subject to the advance royalty conditions set forth in the regulations. The advance royalty shall be based on a percent of the value of a minimum number of tons which shall be determined on a schedule sufficient to exhaust the leased reserves in 40 years from the date of approval of the mining and reclamation plans.

Sec. 8. METHOD OF PAYMENTS. The lessee shall make rental payments to the appropriate BLM office until either production royalties or advance royalties become payable. Thereafter, all rentals, production royalties and advance royalties shall be paid to the Mining Supervisor. All remittances to BLM shall be made payable to the Bureau of Land Management; those to the Geological Survey shall be made payable to the United States Geological Survey.

Sec. 9. EXPLORATION PLAN. As specified in the regulations, the lessee shall submit an exploration plan before conducting any exploration on the leased lands, except casual use, between the effective date of this lease and the date of approval of the mining plan. The lessee shall not commence exploration without an approved exploration plan. Thereafter, the lessee shall conduct all exploration in accordance with the approved exploration plan.

Sec. 10. MINING PLAN. In accordance with the regulations in 30 CFR 211, 700 and 800, if the Lessee has not yet submitted a mining plan, he must do so within three years after the effective date of this readjustment. Unless or until the mining plan has been approved, the Lessee shall not conduct any operations on the leased lands except casual use or exploration, if an exploration plan has been approved. Thereafter, the Lessee shall conduct all operations in accordance with the approved mining plan.

Sec. 11. LOGICAL MINING UNITS (LMU). This lease is automatically considered to be an LMU and may be combined with other land, including other Federal leaseholds and non-Federal interests in coal, to form a larger LMU. The mining plan for such enlarged LMU must include a production schedule that provides for the mining of all the LMU reserves, both Federal and non-Federal, in a period of not more than 40 years from the date of the approval of the plan. The definition of LMU and LMU reserves and other conditions applicable to them are set forth in the regulations (43 CFR 3400.0-5).

Sec. 12. OPERATIONS ON LEASED LANDS. In accordance with the conditions of this lease, the exploration and mining plans, the regulations and the Act, the lessee shall exercise reasonable diligence, skill and care in all operations on the leased lands. The lessee's obligations shall include, but not be limited to the following:

(a) The lessee shall conduct all operations on the leased lands so as to avoid injury to life, health, or property.

(b) The lessee shall conduct operations in such a manner as may be needed to avoid or, where avoidance is impracticable, to minimize and where practicable, to repair damage to: (1) any forage and timber growth on Federal or non-Federal lands in the vicinity of the leased lands; (2) crops, including forage and timber, or improvements of a surface owner; or (3) improvements, whether owned by the United States or by its permittees, licensees, or lessees. The lessor must approve the steps to be taken and the restoration to be made in the event of the occurrence of damage described in this subsection.

(c) The lessee shall minimize to the maximum extent possible wasting of the mineral deposits and other resources, including, but not limited to, surface resources which may be found in, upon, or under such lands.

Sec. 13. CULTURAL RESOURCES -

(a) Before the approval of a mining plan, the authorized officer may require a survey of all or part of the leased land to provide an inventory of any historical, cultural, archeological, and paleontological values. The survey shall be conducted by a qualified professional archeologist, approved by the authorized officer, and a report of the survey shall be submitted to the authorized officer. The approval of an exploration or mining plan or the continuation of lease operations may be conditioned on the approval of the survey report and the approval of measures to protect the historical, cultural, archeological and paleontological values. The cost of any survey or measures to protect such values discovered as a result of the survey shall be borne by the lessee, and items and features of historical, cultural, archeological, or paleontological value shall remain under the jurisdiction of the United States.

(b) If any items or features of historical, cultural, archeological, or paleontological value are discovered during lease operations, the lessee shall immediately notify the Mining Supervisor and shall not disturb such items or features until the Mining Supervisor issues instructions. If the lessee is ordered to take measures to protect any items or features of historical, cultural, archeological, or paleontological value discovered during lease operations, the cost of the measures shall be borne by the lessor, and such items and features shall remain under the jurisdiction of the United States.

Sec. 14. AUTHORIZATION OF OTHER USES AND DISPOSITION OF LEASED LANDS -

(a) The lessor reserves the right to authorize other uses of the leased lands by regulation or by issuing, in addition to this lease, leases, licenses, permits, easements or right-of-way, including leases for the development of minerals other than coal under the Act. The lessor may authorize any other uses of the leased lands that do not unreasonably interfere with the exploration and mining operations of the lessee, and the lessee shall make all reasonable efforts to avoid interference with such authorized uses.

(b) The lessor reserves the right (1) to sell or otherwise dispose of the surface of the leased lands under existing law or laws hereafter enacted insofar as said surface is not necessary for the use of the lessee in the extraction and removal of the coal therein, or (2) to dispose of any resource in such lands if such disposal will not unreasonably interfere with the exploration and mining operations of the lessee.

(c) If the leased lands have been or shall hereafter be disposed of under laws reserving to the United States the deposits of coal therein, the lessee shall comply with all conditions as are or may hereafter be provided by the laws and regulations reserving such coal.

Sec. 15. EQUAL OPPORTUNITY CLAUSE. The lessee will comply with all provisions of Executive Order No. 11246 of September 24, 1965, as amended, and of the rules, regulations and relevant orders of the Secretary of Labor.

Sec. 16. CERTIFICATION OF NONSEGREGATED FACILITIES. By entering into this lease, the lessee certifies that he does not and will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not and will not permit his employees to perform their services at any location under his control where segregated facilities are maintained. The lessee agrees that a breach of this certification is a violation of the Equal Opportunity clause of this lease. As used in this certification, the term "segregated facilities" means, but is not limited to, any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise. Lessee further agrees that (except where lessee has obtained identical certifications from proposed contractors and subcontractors for specific time periods) lessee will obtain identical certifications from proposed contractors and subcontractors prior to award of contracts or subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity clause; that lessee will retain such certifications in lessee's files; and that lessee will forward the following notice to such proposed contractors and subcontractors (except where proposed contractor or subcontractor has submitted identical certifications for specific time periods). Notice is to be provided by lessee to prospective contractors and subcontractors of requirement for certification of nonsegregated facilities. A Certification of Non-segregated Facilities, as required by the May 9, 1967 Order (32 F.R. 7439, May 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted prior to the award of a contract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity clause. Certification may be submitted either for each contract and subcontract or for all contracts and subcontracts during a period (i.e., quarterly, semiannually, or annually).

Sec. 17. EMPLOYMENT PRACTICES. The lessee shall pay all wages due persons employed on the leased lands at least twice each month in lawful money of the United States. The lessee shall grant all miners and other employees complete freedom to purchase goods and services of their own choice. The lessee shall restrict the workday to not more than 8 hours in any one day for underground workers, except in case of emergency. The lessee shall employ no person under the age of 16 years in any mine below the surface. If the laws of the State in which the mine is situated provides for a minimum age restriction for mining below the surface, other than the requirements of Federal law, the laws of the State shall prevail.

Sec. 18. MONOPOLY AND FAIR PRACTICES. The lessor reserves full authority to promulgate and enforce orders and regulations under the provisions of Sections 30 and 32 of the Act (30 U.S.C. §§ 187 and 189) necessary to insure that any sale of the production from the leased lands to the United States or to the public is at reasonable prices, to prevent monopoly, and to safeguard the public welfare, and such regulations shall upon promulgation be binding upon the lessee.

Sec. 19. ASSIGNMENT. This lease may be assigned, upon approval of the authorized officer in accordance with the provisions of 43 CFR subpart 3453. An assignment will become effective on the first day of the month following approval by the authorized officer or, if the assignee requests, the first day of the month of approval.



Sec. 20. RELINQUISHMENT OF LEASE. The lessee may file a request to relinquish all or any legal subdivision of this lease. The request shall be filed in duplicate with the authorized officer. The authorized officer shall approve the relinquishment if he determines that the lessee has complied with the requirements of the lease, the exploration and mining plans, the regulations and the Act. Upon approval, the relinquishment shall be effective as of the date it is filed, subject to the continued obligation of the lessee and his surety to pay all accrued rentals and royalties and to comply with all other requirements of the lease, the regulations and the Act.

Sec. 21. NONCOMPLIANCE. Any failure to comply with the conditions of this lease, the exploration and mining plans, the regulations, or the Act shall be dealt with in accordance with the procedures set forth in the regulations.

Sec. 22. WAIVER OF CONDITIONS. The lessor reserves the right to waive any breach of the conditions contained in this lease, except the breach of such conditions as are required by the Act, but any such waiver shall extend only to the particular breach so waived and shall not limit the rights of the lessor with respect to any future breach; nor shall the waiver of a particular breach prevent cancellation of this lease for any other cause, or for the same cause occurring at another time.

Sec. 23. READJUSTMENT OF TERMS AND CONDITIONS -

(a) This lease is subject to reasonable readjustment of any conditions of the lease, including royalty rates, at the end of this readjustment period on \_\_\_\_\_, and subject to readjustment at the end of each 10-year period thereafter. The lessor shall notify the lessee whether he intends to readjust conditions and, if he intends to readjust, the nature of the readjustments. The lessor shall give notice 120 days before the end of this readjustment period as to whether the lease terms will be readjusted. Unless the lessee, within 60 days after receipt of the proposed readjusted conditions files with the lessor an objection or relinquishes the lease as of the effective date of the readjustment, the lessee shall be deemed conclusively to have agreed to such conditions.

(b) If the lessee files objections to the proposed readjusted conditions with the lessor, and agreement cannot be reached between the lessor and the lessee within a period of 60 days after the filing of the objections, the lease may be terminated by either party upon giving 30 days' notice to the other party; however, the lessor's right to terminate the lease shall be suspended by the lessee's filing of a notice of appeal pursuant to section 29 of this lease, and if the lessee is ultimately successful in his appeal, the lease shall continue without the change in the provisions, the imposition of which, the lessee appealed. If the lessee is unsuccessful in his appeal and, within 30 days after receipt of the decision on appeal notifies the lessor that he accepts the decision rendered upon such appeal, then the lease shall continue as amended by the decision.

(c) If the lessee files objections to the proposed readjusted conditions, the existing conditions, except those concerning royalties, shall remain in effect until there has been an agreement between the lessor and the lessee on the new conditions to be incorporated in the lease, or until the lease is terminated; however, the readjusted royalty provisions shall be effective until there is either agreement between the lessor and the lessee or until the lease is terminated. If the readjusted royalty provisions are subsequently rescinded or amended, the lessee shall be permitted to credit any excess royalty payments against royalties subsequently due to the lessor.

Sec. 24. DELIVERY OF PREMISES. Upon termination of this lease for any reason, or relinquishment of a part of this lease, the lessee shall deliver to the lessor in good order and condition all or the appropriate part of the leased lands. Delivery of the leased lands shall include underground timbering and such other supports and structures as are necessary for the preservation of the mine or deposit, and shall be in accordance with all other applicable provisions of the regulations for the completion of operations and abandonment.

Sec. 25. PROPRIETARY INFORMATION. Geological and geophysical data and information, including maps, trade secrets, and commercial and financial information which the lessor obtains from the lessee shall be treated in accordance with 43 CFR Part 2 and other applicable regulations.

Sec. 26. LESSEE'S LIABILITY TO LESSOR -

(a) The lessee shall be liable to the United States for any damage suffered by the United States in any way arising from or connected with the lessee's activities and operations under this lease, except where damage is caused by employees of the United States acting within the scope of their authority.

(b) The lessee shall indemnify and hold harmless the United States from any and all claims arising from or connected with the lessee's activities and operations under this lease.

(c) In any case where liability without fault is imposed on the lessee pursuant to this section, and the damages involved were caused by the action of a third party, the rules of subrogation shall apply in accordance with the law of the jurisdiction where the damages occurred.

Sec. 27. INSPECTIONS AND INVESTIGATIONS -

(a) All books and records maintained by the lessee showing information required by this lease or regulations must be kept current and in such manner that the books and records can be readily checked, upon request, by the Mining Supervisor or his representative at the place where they are customarily maintained.

(b) The lessee shall permit any duly authorized officer or representative of the lessor at any reasonable time (1) to inspect or investigate the leased lands and all surface and underground improvements, works, machinery, and equipment, and all books and records pertaining to the lessee's obligations to the lessor under this lease and regulations and (2) copy, and make extracts from any such books and records.

Sec. 28. UNLAWFUL INTEREST. No member of, or Delegate to, Congress, or Resident Commissioner, after his election or appointment, either before or after he has qualified and during his continuance in office, and no officer, or employee of the Department of the Interior, except as provided in 43 CFR 7.4(a)(3), shall hold any share or part in this lease or derive any benefit therefrom. The provisions of Section 3741 of the Revised Statutes, as amended, 41 U.S.C. Section 22, and the Act of June 25, 1948, (62 Stat. 702, as amended, 18 U.S.C. §§ 431-433), relating to contracts, enter into and form a part of this lease insofar as they may be applicable.

Sec. 29. APPEALS. The lessee shall have the right to appeal (a) under 43 CFR 3000.4 from an action or decision of any official of the Bureau of Land Management (b) under 30 CFR Part 290 from an action, order, or decision of any official of the United States Geological Survey, or (c) under applicable regulation from any action or decision of any other official of the Department of the Interior arising in connection with this lease, including any action or decision pursuant to Section 23 of this lease with respect to the readjustment of conditions.

Sec. 30. SPECIAL STATUTES. This lease is also subject to the provisions of the Federal Water Pollution Control Act (33 U.S.C. 1151-1175) and the Clean Air Act (42 U.S.C. 1857).

Sec. 31. SPECIAL STIPULATIONS -

APPENDIX 3

SOILS

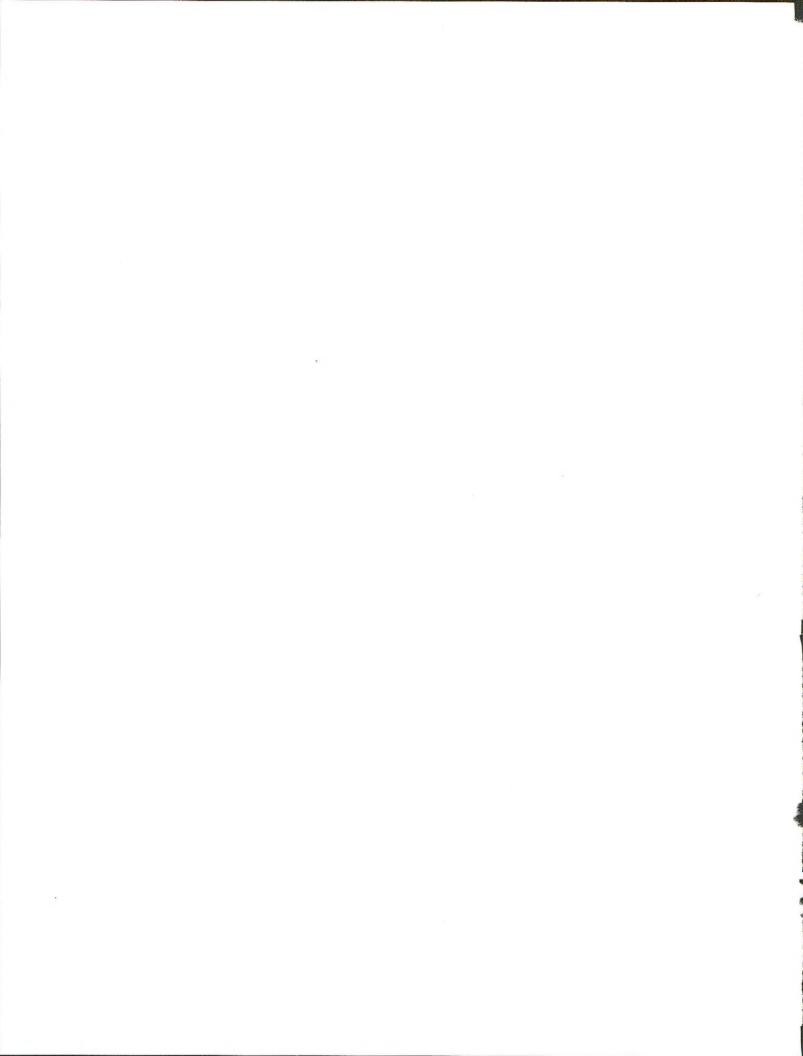


TABLE A3-1.  
DISTRIBUTION OF SOIL MAPPING UNITS FOR  
THE CAMP SWIFT STUDY AREA, BASTROP COUNTY, TEXAS

| Map Symbol | Mapping Unit   | Study Area      |         | Bastrop County          |                          |
|------------|--|-----------------|---------|-------------------------|--------------------------|
|            |  | Acreage in Area | Percent | Total Acreage in County | Percent of Total Acreage |
| AfC        | Axtell fine sandy loam, 1 to 5 percent slopes          | 1360            | 20.2    | 43,330                  | 7.7                      |
| AfC2       | Axtell fine sandy loam, 2 to 5 percent slopes, eroded  | 1577            | 23.2    | 33,900                  | 6.0                      |
| AfE2       | Axtell fine sandy loam, 5 to 12 percent slopes, eroded | 83              | 1.2     | 7,270                   | 1.3                      |
| AtD        | Axtell-Tabor complex, 1 to 8 percent slopes            | 42              | 0.6     | 39,600                  | 6.9                      |
| CfB        | Crockett fine sandy loam, 1 to 3 percent slopes        | 20              | 0.3     | 16,200                  | 2.8                      |
| CsC2       | Crockett soils, 2 to 5 percent slopes, eroded          | 1139            | 16.9    | 45,450                  | 8.0                      |
| CsE2       | Crockett soils, 5 to 10 percent slopes, eroded         | 11              | 0.2     | 5,290                   | 0.9                      |
| CsD3       | Crockett soils, 3 to 8 percent slopes, severely eroded | 276             | 4.1     | 11,510                  | 2.0                      |
| DeC        | Demona loamy fine sand, 1 to 5 percent slopes          | 789             | 11.8    | 46,600                  | 8.2                      |
| FeF2       | Ferris clay, 5 to 20 percent slopes, eroded            | 18              | 0.3     | 4,880                   | 0.9                      |
| Gs         | Gowen soils, frequently flooded                        | 112             | 1.7     | 10,990                  | 1.9                      |
| MaA        | Mabank loam, 0 to 1 percent slopes                     | 8               | 0.1     | 6,180                   | 1.1                      |
| MaB        | Mabank loam, 1 to 3 percent slopes                     | 8               | 0.1     | 6,710                   | 1.2                      |
| PaE        | Patillo complex, 1 to 12 percent slopes                | 416             | 6.2     | 59,820                  | 10.4                     |
| Sa         | Sayers fine sandy loam                                 | 298             | 4.4     | 1,570                   | 0.3                      |
| SKC        | Siltid loamy fine sand, 1 to 5 percent slopes          | 166             | 2.5     | 25,940                  | 4.5                      |
| TfA        | Tabor fine sandy loam, 0 to 1 percent slopes           | 36              | 0.5     | 5,400                   | 0.9                      |
| TfB        | Tabor fine sandy loam, 1 to 3 percent slopes           | 356             | 5.3     | 36,630                  | 6.4                      |
| WaB        | Wilson clay loam, 1 to 3 percent slopes                | 17              | 0.3     | 10,580                  | 1.9                      |

Source: Baker 1979

TABLE A3-2.  
PHYSICAL AND CHEMICAL PROPERTIES OF EXISTING SOILS IN THE STUDY AREA

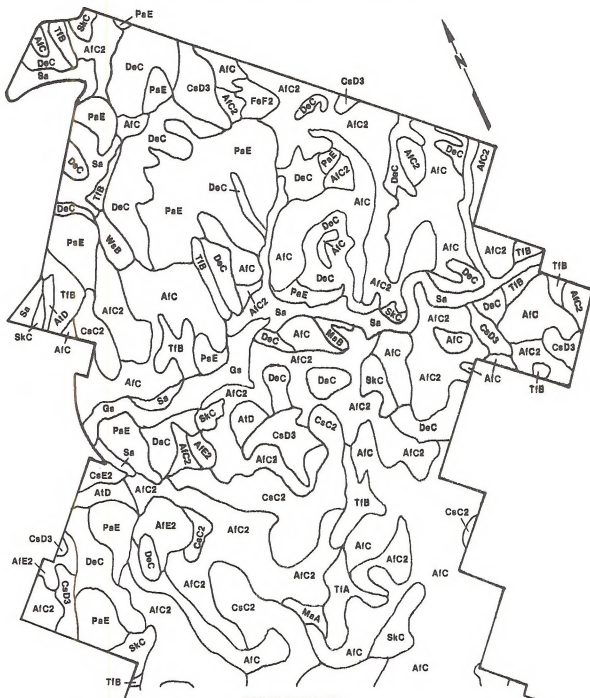
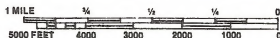
| Soil Series | Hydro-logic group | Depth to Seasonal High Water Table (Inches) | Depth Internal (Inches) | USDA Texture                 | Liquid Limit | Plasticity Index | Permeability (in/hr) | Available Water  |                   | Soil pH | Organic <sup>(b)</sup> Matter (%) | Shrink-Swell Potential | Drainage Characteristics | Erosion Factors <sup>(c)</sup> |                   |
|-------------|-------------------|---|-------------------------|------------------------------|--------------|------------------|----------------------|------------------|-------------------|---------|-----------------------------------|------------------------|--------------------------|--------------------------------|-------------------|
|             |                   |   |                         |                              |              |                  |                      | Capacity (in/in) | Retention (in/in) |         |                                   |                        |                          | K                              | T                 |
| Axtell      | D                 | >60   | 0-8                     | Fine sandy loam              | <30          | NP-7             | 0.6-2.0              | 0.11-0.15        | 5.6-6.5           | 0.5-1   | Low                               | Percolates slowly      | 0.43                     | 5                              |                   |
|             |                   |   | 8-48                    | Clay sandy clay              | 45-55        | 25-35            | <0.06                | 0.16-0.18        | 4.5-6.5           | 0.5-1   | High                              |                        |                          |                                |                   |
|             |                   |   | 48-76                   | Sandy clay loam, sandy clay, | 35-45        | 15-25            | 0.6-2.0              | 0.15-0.18        | 5.6-8.4           |         | Moderate                          |                        |                          |                                |                   |
| Crockett    | D                 | >60   | 0-4                     | Loam                         | 15-35        | 2-15             | 0.6-2.0              | 0.13-0.17        | 6.1-6.5           | 0.5-2   | Low                               | Not needed             | 0.43                     | 5                              |                   |
|             |                   |   | 4-60                    | Clay, clay loam              | 45-55        | 25-35            | <0.06                | 0.14-0.18        | 6.1-8.4           | 0.30    | High                              |                        |                          |                                |                   |
| Demona      | C                 | 24-36                                       | 0-28                    | Loamy fine sand              | <25          | NP-5             | 2.0-6.0              | 0.05-0.10        | 6.1-7.3           |         | Very low                          | Cutbanks cave;         | 0.17                     | 5                              |                   |
|             |                   |   | 28-62                   | Sandy clay                   | 42-60        | 24-40            | 0.2-0.6              | 0.15-0.18        | 5.1-6.5           |         | Moderate                          |                        |                          |                                | Percolates slowly |
| Mabank      | D                 | 6-12  | 0-6                     | Loam                         | <30          | NP-10            | 0.6-2.0              | 0.11-0.15        | 6.1-7.3           | 1-2     | Low                               | Percolates slowly      |                          |                                |                   |
|             |                   |   | 6-64                    | Clay                         | 42-65        | 25-40            | <0.06                | 0.12-0.16        | 6.1-8.4           |         | High                              |                        |                          |                                |                   |
| Patilo      | B                 | 48-72                                       | 0-52                    | Fine sand                    | <25          | NP-4             | 6.0-20               | 0.05-0.08        | 6.1-7.3           | 0.5-2   | Very low                          | Cutbanks cave          | 0.17                     | 5                              |                   |
|             |                   |   | 52-70                   | Sandy clay loam              | 22-35        | 11-20            | 0.2-0.6              | 0.14-0.18        | 5.1-6.5           |         | Low                               |                        |                          |                                |                   |
| Sayers      | A                 | 60-120                                      | 0-10                    | Fine sandy loam              | 20-30        | 4-12             | 2.0-6.0              | 0.11-0.15        | 6.1-7.3           | -       | Low                               | Floods                 |                          |                                |                   |
|             |                   |   | 10-60                   | Loamy fine sand, fine sand   | <27          | NP-4             | 6.0-20               | 0.05-0.10        | 6.1-7.3           | -       | Low                               |                        |                          |                                |                   |
| Silstid     | A                 | >60   | 0-20                    | Loamy fine sand              | <22          | NP-3             | 6.0-20               | 0.05-0.10        | 5.1-6.0           | <1.0    | Low                               | Not needed             | 0.17                     | 5                              |                   |
|             |                   |   | 28-56                   | Sandy clay loam, clay loam   | 20-35        | 9-22             | 0.6-2.0              | 0.12-0.17        | 5.1-5.5           |         | Low                               |                        |                          |                                |                   |
|             |                   |   | 56-80                   | Clay loam, fine sandy loam   | 20-35        | 15-22            | 0.6-2.0              | 0.10-0.16        | 5.1-5.5           |         | Low                               |                        |                          |                                |                   |
| Tabor       | D                 | >60   | 0-15                    | Fine sandy loam              | <25          | NP-7             | 0.6-2.0              | 0.13-0.15        | 5.6-6.5           | <1.0    | Low                               | Not needed             | 0.34                     | 5                              |                   |
|             |                   |   | 15-30                   | Clay                         | 51-60        | 28-36            | <0.06                | 0.14-0.18        | 5.1-7.8           |         | High                              |                        |                          |                                |                   |
|             |                   |   | 30-63                   | Clay                         | 51-60        | 28-35            | <0.06                | 0.14-0.18        | 5.6-7.8           |         | High                              |                        |                          |                                |                   |
| Wilson      | D                 | 6-12  | 0-6                     | Clay loam                    | 25-35        | 9-17             | 0.2-0.6              | 0.15-0.20        | 6.1-7.3           | 0.5-2   | Low                               | Percolates slowly; wet | 0.43                     | 5                              |                   |
|             |                   |   | 6-42                    | Clay                         | 41           | 25-35            | <0.06                | 0.15-0.20        | 6.6-8.4           |         | High                              |                        |                          |                                |                   |
|             |                   |   | 42-65                   | Clay                         | 41           | 25-35            | <0.06                | 0.12-0.15        | 7.4-8.4           |         | High                              |                        |                          |                                |                   |

(a) Sources: Baker 1979, USDA

(b) Source: Soil Series Descriptions USDA-SCS Form 5R

(c) K = Soil erodibility factor as defined by Wischmeier (1962).  
T = Allowable soil loss in tons per acre.

SOIL MAP OF THE PROPOSED LEASE AREA, CAMP SWIFT, BASTROP COUNTY, TEXAS



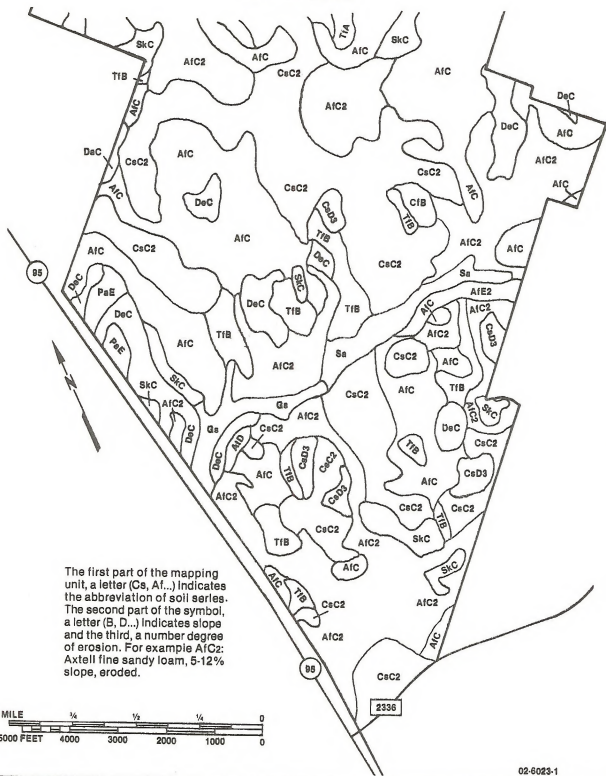
SOIL MAP (CONT.)

02-8022-1

MAP A3-1

Soil Map of the Proposed Alternative Lease Areas,  
Camp Swift, Bastrop County, Texas.

SOIL MAP (CONT.)



The first part of the mapping unit, a letter (Cs, A1...) indicates the abbreviation of soil series. The second part of the symbol, a letter (B, D...) indicates slope and the third, a number degree of erosion. For example A1C2: Axtell fine sandy loam, 5-12% slope, eroded.

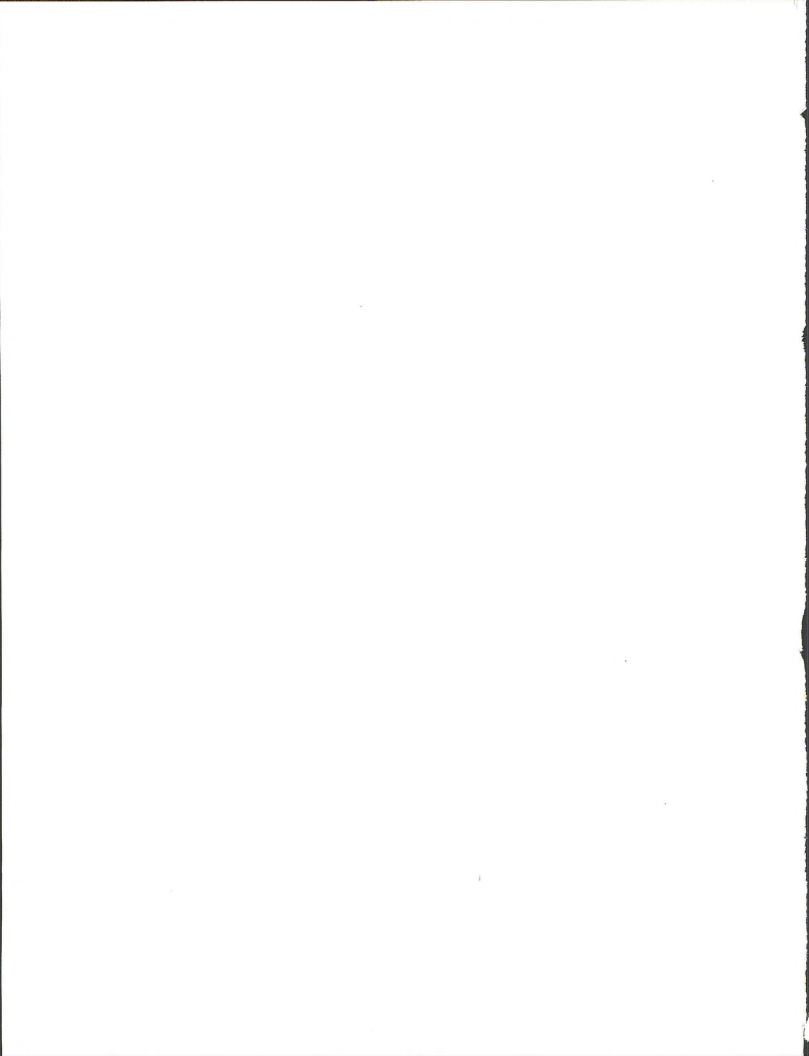
02-6023-1

Map A3-1 (continued).



APPENDIX 4

HYDROLOGY



APPENDIX 4

HYDROLOGY

EXPLANATION OF GROUNDWATER HYDROLOGY CALCULATIONS

Highwall Seepage Calculations (U.S. Dept. Army, Navy, Air Force 1971, p. 128)

Assumptions:

1. Mine cut is a fully penetrating line slot
2. Permeability  $k = 1 \text{ m/d}$
3. Vertical distance from groundwater table to excavation floor is 15 meters ( $H = 15 \text{ m}$ )
4. Seepage emerges at floor of excavation ( $h_o = 0$ )
5. Horizontal distance from mine cut to undisturbed groundwater table is 60 meters (estimated  $L = 60 \text{ m}$ )
6. Length of mine excavation is 460 meters ( $x = 460 \text{ m}$ ).
7. Steady-state flow conditions exist

Calculate:  $\text{Flow} = \frac{kx}{2L} (H^2 - h_o^2)$

$$\text{Flow} = \frac{(1 \text{ m/d})(460 \text{ m})}{2(60 \text{ m})} [(15 \text{ m})^2 - 0^2]$$
$$= 862.5 \text{ m}^3/\text{d}$$

$\text{Flow} = 10 \text{ liters/sec (160 gallons/minute)}$

Pumping Rates from Pressure Relief Wells (U.S. Dept. Army, Navy, Air Force 1971, pp. 147-148)

Assumptions:

1. Pressure relief wells are aligned in a row parallel to the mine cut.
2. Relief wells penetrate the upper 25% of the Simsboro Sand; flow is under artesian conditions.

3. Depth of the excavation is 61 meters.
4. Top of the Simsboro Sand is at the base of the excavation.
5. Potentiometric surface of the Simsboro Sand is 150 feet above the excavation floor ( $H = 45$  m).
6. Distance from the relief wells to the source of seepage is 61 meters ( $L = 61$  m, arbitrarily chosen to equal the width of the excavation).
7. Permeability of the Simsboro Sand aquifer equals 10 meters/day ( $k = 10$  m/d).
8. Saturated thickness of the Simsboro Sand aquifer is 185 meters ( $D = 185$  m).
9. Spacing between relief wells equals 61 meters ( $a = 61$  m, arbitrarily chosen to equal the width of the excavation).
10. Length of excavation is 460 meters.
11. Radius of a relief well equals 0.075 meters ( $r_w = 0.075$  m).

Calculations:

Partial penetration factor ( $\Theta_a$ ) is 4.2; derived from graph by comparing  $a$ ,  $r_w$ , and  $D$  (U.S. Dept. Army, Navy, Air Force 1971, p. 148).

Pumping rate ( $Q$ ) for each relief well equals.

$$Q = \frac{H k D}{(L/a + \Theta_a)}$$

$$= \frac{(45 \text{ m})(10 \text{ m/d})(185 \text{ m})}{\left[ \frac{(61 \text{ m})}{(61 \text{ m})} + 4.2 \right]}$$

$$Q = 190 \text{ liters/sec for each well}$$

Therefore, for a total of 8 pressure relief wells,

$$\text{Total flow} = 1500 \text{ l/s or } 24,000 \text{ gpm}$$

Computation of theoretical water level declines in the Simsboro Sand

Assumptions:

1. Simsboro Sand aquifer is homogeneous, isotropic, and areally extensive.
2. Consider the mine excavation and depressurization operations to behave as a very large diameter well after 90 days

Given:

1. Flow from well equals 1500 l/s (Q).
2. Storage coefficient equals  $5 \times 10^{-4}$  (S).
3. Transmissivity equals  $1875 \text{ m}^2/\text{d}$  (T).

Calculate:

Use the Theis non-equilibrium formula, modified to account for partial penetration effects (Walton 1970, p. 139-140):

$$\text{Drawdown} = \frac{Q}{4 \pi T} W(u, r/m, \gamma)$$

where  $m$  = aquifer thickness

$\gamma$  = percent of penetration

$$u = \frac{r^2 S}{4 T t}$$

Using values of  $W(u, r/m, \gamma)$  (Walton 1970),

| <u>Distance from excavation, meters</u> | <u>u</u>              | <u>W(u, r/m, <math>\gamma</math>)</u> |
|---|-----------------------|---------------------------------------|
| 300                                     | $6.9 \times 10^{-5}$  | 9.0                                   |
| 800                                     | $4.82 \times 10^{-4}$ | 7.05                                  |
| 1600                                    | $1.93 \times 10^{-3}$ | 5.67                                  |
| 3000                                    | $6.9 \times 10^{-3}$  | 4.4                                   |

Therefore, using the Theis formula to determine drawdown at various distances from the excavation,

| <u>Distance from excavation, meters</u> | <u>Drawdown, meters</u> |
|---|-------------------------|
| 300                                     | 50                      |
| 800                                     | 39                      |
| 1600                                    | 32                      |
| 3000                                    | 24                      |

DETERMINATION OF AVERAGE DISCHARGES IN BIG SANDY,  
MCLAUGHLIN, AND DOGWOOD CREEKS

The average discharges of Camp Swift area surface waters are determined by comparing them to nearby streams with similar characteristics that have a long term period of record. The streams used for this comparison with their drainage areas and average discharge values are presented in Table A4-1. This data is plotted in Figure A4-1. A logarithmic regression analysis was performed to determine the equation of the line which best fits these points. This analysis yields an equation of the form

$$y = ax^b$$

where

x = drainage area, and

y = average discharge.

In this case, the analysis yielded a = 0.49 and b = 0.91 resulting in the equation  $y = 0.49 x^{0.91}$  with a correlation coefficient of 0.988. The correlation coefficient is an indicator of how strong the correlation is with +1 being a perfect correlation. Using Figure A4-1 with the drainage areas for Big Sandy, McLaughlin and Dogwood Creeks yields their respective average discharges. These are presented in Table 2-7 of the EIS.

TABLE A4-1  
 STREAMS USED FOR DETERMINATION OF AVERAGE FLOW OF  
 BIG SANDY, McLAUGHLIN, AND DOGWOOD CREEKS

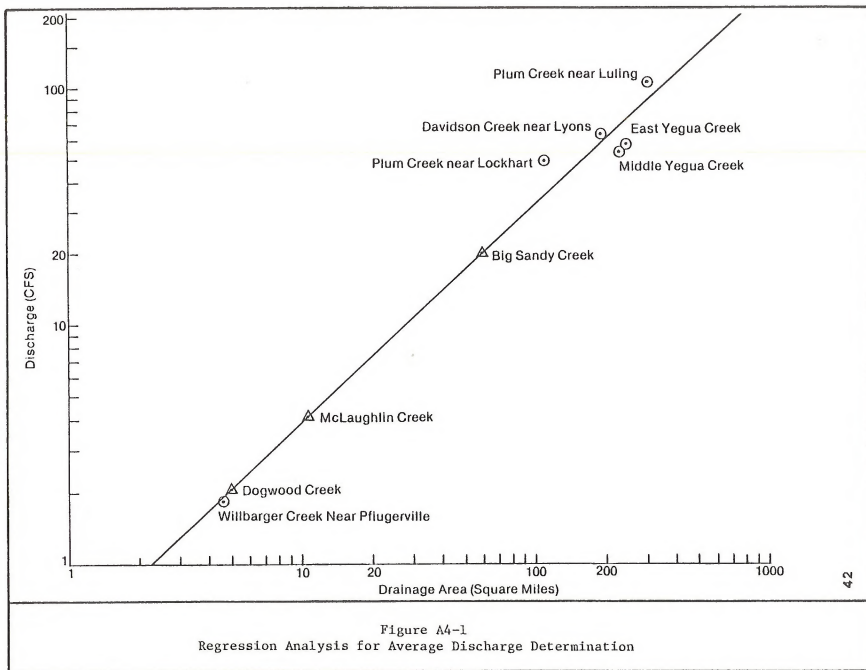
|   | Willbarger<br>Creek<br>Near<br>Pflugerville,<br>Texas | Plum<br>Creek<br>at<br>Luling,<br>Texas | Plum<br>Creek<br>at<br>Lockhart,<br>Texas | Davidson<br>Creek<br>Near<br>Lyons,<br>Texas | Middle<br>Yegua Creek<br>Near<br>Dime Box,<br>Texas | East<br>Yegua Creek<br>Near<br>Dime Box,<br>Texas |
|---|---|---|---|--|---|---|
| Drainage Area <sup>a</sup><br>(sq mi)   | 4.6   | 309                                     | 112                                       | 195  | 236   | 244   |
| Average Discharge <sup>b</sup><br>(cfs) | 1.85  | 105                                     | 49.2                                      | 63.8   | 54.1  | 57.6  |

Source: USGS Water-Dat Report TX-78-2,3

<sup>a</sup>Multiply by 259 to obtain area in hectares.

<sup>b</sup>Multiply by 0.028 to obtain discharge in m<sup>3</sup>/sec.





## FLOOD FREQUENCY CALCULATIONS

The 25- and 100-year flood flows for Big Sandy, McLaughlin, and Dogwood Creeks were determined using the USGS "Techniques for Estimating the Magnitude and Frequency of Floods in Texas" (USGS 1977). These creeks are located in the USGS flood frequency Region No. 2. The equations for the 25- and 100-year flood flows for streams in this region are:

$$Q_{25} = 485A^{0.668} S^{0.236} \text{ cfs}$$

$$Q_{100} = 628A^{0.694} S^{0.261} \text{ cfs}$$

where

A = Drainage area in square miles,  
and S = Average slope of the stream bed between  
points 10 and 85 percent of the distance  
along the main stream channel from the  
point in question in feet per mile.

Values for the areas and slopes used in determining flood flows for the Camp Swift area surface waters are presented in Table A4-2.

TABLE A4-2

|               | Big Sandy | McLaughlin | Dogwood |
|---------------|-----------|------------|---------|
| Area (sq mi)  | 60.5      | 10.9       | 5.5     |
| Slope (ft/mi) | 12.3      | 15         | 20      |

The 25- and 100-year flood flows determined by this method are presented in Table 2-7 of the EIS.

## DETERMINATION OF SEDIMENT LOAD FOR EXISTING ENVIRONMENT

The Universal Soil Loss Equation is:

$$A = R K L S C P$$

where A is computed soil loss per unit of area (tons/acre), R is a rainfall factor usually expressed as the product of rainfall energy times the maximum 30-minute intensity for a given rainstorm, K is soil erodibility (tons/acre - R unit), LS is a dimensionless length slope factor for accounting variations in length and slope, C is a dimensionless cover factor relating the effectiveness of vegetal cover in reducing erosion, and P is a dimensionless conservation practice factor. (Haan 1978)

For the lease area

$$R = 300 \text{ (average annual)}$$

$$K = .40 \text{ weighted average}$$

$$LS = 0.5 \text{ (slope} = 2.27\% \text{ and length} = 1,320 \text{ ft.)}$$

and CP = .0054 based on vegetation and canopy of the area.

Therefore,

$$A = (300) (.40) (0.5) (0.0054)$$

$$= 0.324 \text{ tons/acre/year.}$$

$$= 0.294 \text{ metric tons/acre/year}$$

The sediment delivery ratio (expressed as a percentage of the on-site eroded material that reaches a given point) for watersheds of the size of McLaughlin and Dogwood Creeks is 0.18.

Sediment load for McLaughlin Creek under present conditions

$$= (10.92 \text{ mi}^2) (640 \text{ acres/mi}^2) (0.294 \frac{\text{metric tons}}{\text{ac/yr}})$$

$$\begin{aligned} & \times (0.18 \text{ sediment delivery ratio}) \\ & = 369 \text{ metric tons per year.} \end{aligned}$$

Sediment load for Dogwood Creek under present conditions

$$\begin{aligned} & = (5.5) (640) (0.294) (0.18) \\ & = 186 \text{ metric tons per year.} \end{aligned}$$

## DOMESTIC WASTEWATER FLOW CALCULATION

The following equation is used to calculate the wastewater flow by a wastewater treatment facility serving a given population.

$$Q = P \times C$$

where

Q = flow in gallons per day

P = population served by facility

and

C = wastewater generated per person per day.

The maximum work force for the mine is expected to be near 300 persons. Therefore,  $P = 300$ .

Based on design criteria (EPA, Wastewater Design, 1977) the volume produced by day workers is 15 gallons per person per day.

Thus:

$$Q = P \times C$$

$$Q = 300 \text{ persons} \times 15 \text{ gallons/person/day}$$

$$Q = 4,500 \text{ gallons/day}$$

$$Q = 0.0001 \text{ meters}^3/\text{day}$$

## CALCULATION OF RUNOFF FROM MINE AREA

An estimate of the increase in rainfall runoff from disturbed and reclaimed areas of the mine was made using the Soil Conservation Service (SCS) relationship:

$$Q = \frac{(P - 0.25)^2}{P + 0.85}$$

where  $Q$  = inches of runoff

$P$  = precipitation

and  $S = 1,000/CN - 10$

where  $CN$  is known as a curve number.

Estimated curve numbers for undisturbed versus disturbed land are 77 versus 91, respectively (Haan, 1978).

For an arbitrary 2 inch rainfall,

$Q = 0.45$  inches for undisturbed (existing) conditions

and  $Q = 1.16$  inches for disturbed land.

The ratio of disturbed to undisturbed runoff is therefore

$$1.16/0.45 = 2.58.$$

The average annual discharge per square mile is calculated using values from McLaughlin Creek (Section 2.3.1).

$$\begin{aligned} \text{Runoff per square mile} &= \frac{4.3 \text{ cfs}}{10.9 \text{ mi}^2} \\ &= 0.39 \text{ cfs/mi}^2 \end{aligned}$$

The total area to be mined is 4,000 acres, or  $6.25 \text{ mi}^2$ . Therefore, present runoff from this area is

$$\begin{aligned} Q &= 6.25 \text{ mi}^2 \times 0.39 \text{ cfs/mi}^2 \\ &= 2.44 \text{ cfs} \end{aligned}$$

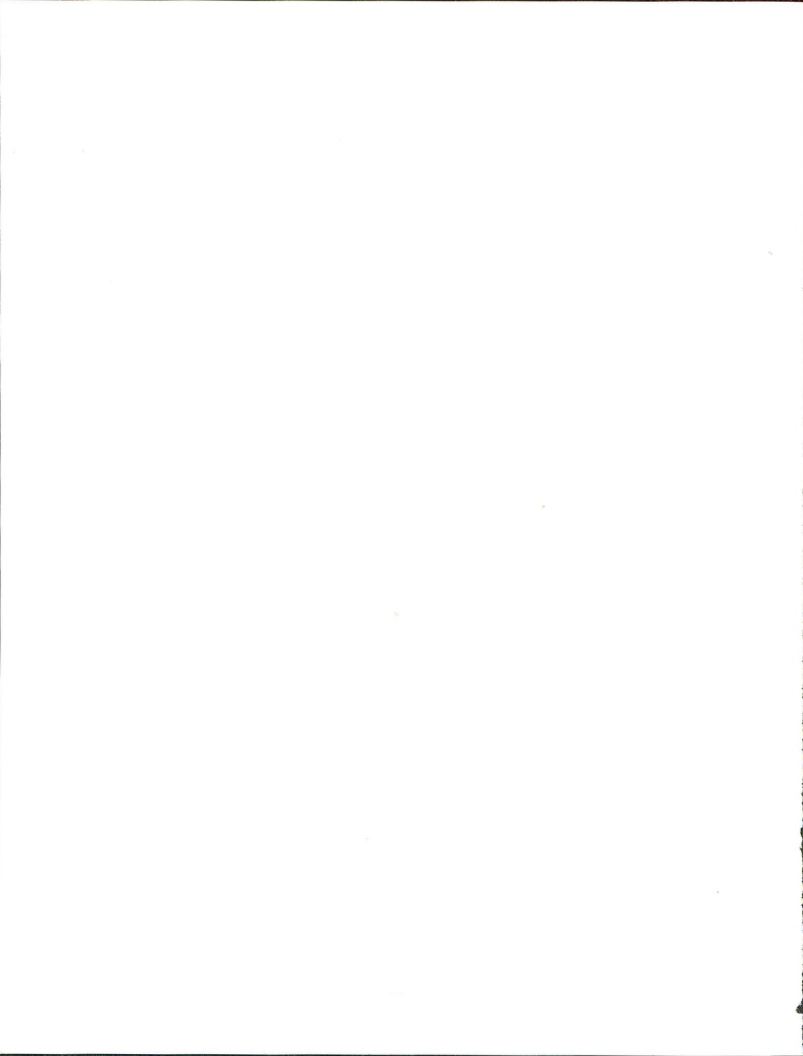
The flow expected from disturbed land would be

$$Q = 2.58 \times 2.44 \text{ cfs}$$

$$= 6.30 \text{ cfs}$$

Subtracting existing flow of 2.44 cfs results in an incremental flow increase of 3.86 cfs

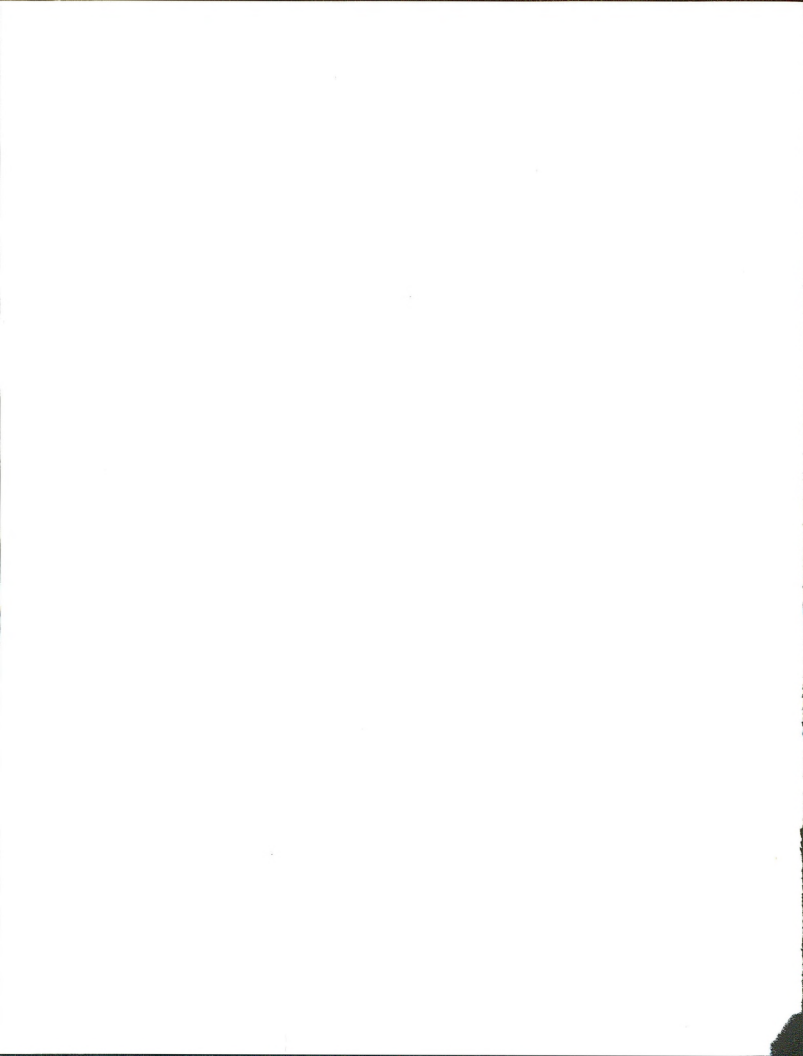
$$= 0.1 \text{ m}^3/\text{sec}$$





APPENDIX 5

BIOLOGICAL ASSESSMENT:  
FEDERAL THREATENED OR ENDANGERED SPECIES



BIOLOGICAL ASSESSMENT:  
FEDERAL THREATENED OR ENDANGERED SPECIES

SECTION 1

INTRODUCTION

The Bureau of Land Management (BLM) is currently considering leasing the Camp Swift Military Reservation in Bastrop County, Texas. This leasing action, if completed, would potentially result in a surface mining operation for recovery of the underlying lignite deposits. The proposed leasing action and attendant effects from subsequent mining require consultation between the BLM and the Fish and Wildlife Service (FWS) concerning potential effects on federally listed Threatened and Endangered Species. This consultation is required under Section 7(c) of the Endangered Species Act and Amendments of 1978.

Previous consultation between the BLM and FWS (BLM 1980) identified three endangered wildlife species potentially occurring in the Camp Swift area. There are no proposed listed Endangered or Threatened wildlife or plant species or listed plant species considered to potentially occur within that area. The species reviewed in this report and summary findings include:

- Houston Toad (Bufo houstonensis) - No Effect
- American Alligator (Alligator mississippiensis) - No Effect
- Bald Eagle (Haliaeetus leucocephalus) - No Effect

1.1 AFFECTED AREA

The Camp Swift Military Reservation is located in the central Texas region approximately 48 kilometers (30 miles) east of Austin, Texas. Camp Swift lies within the Colorado River drainage, 8 kilometers (5 miles) north and east of the river channel. The regional location is shown in Figure 1. The camp

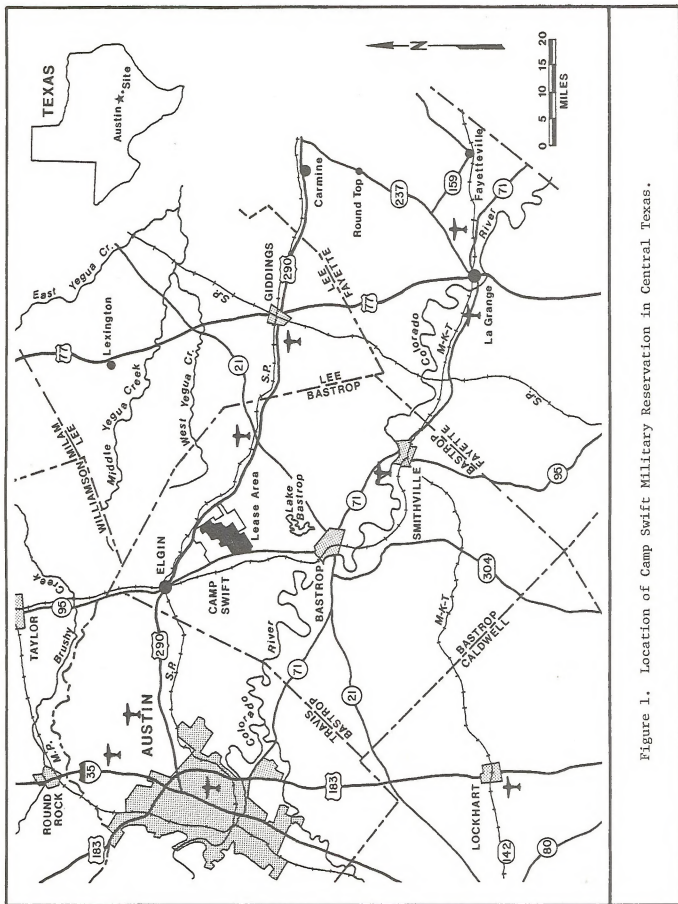


Figure 1. Location of Camp Swift Military Reservation in Central Texas.

is 4743 hectares (11,740 acres) in total surface area, and proposed lease area is 2697 hectares (6664 acres). The relationship of the overall reservation to the proposed lease area is shown in Figure 2.

## 1.2 PROPOSED ACTION AND ALTERNATIVES

The proposed action consists of leasing 2697 hectares (6664 acres) of the Camp Swift Military Reservation to one or several local, publicly owned electric utilities. This leasing action has been proposed in response to the Lower Colorado River Authority's application under provision of the Federal Coal Leasing Act of 1976. The purpose of this action would be to allow the selected utility/utilities to recover the underlying lignite deposits. Therefore, the leasing action would probably result in surface mining activity.

Two alternative actions have been considered. The first includes increasing the lease area by adding a 56.6 hectare (140 acre) area on the southwestern edge of the proposed action lease area. The second alternative is to reject the application.

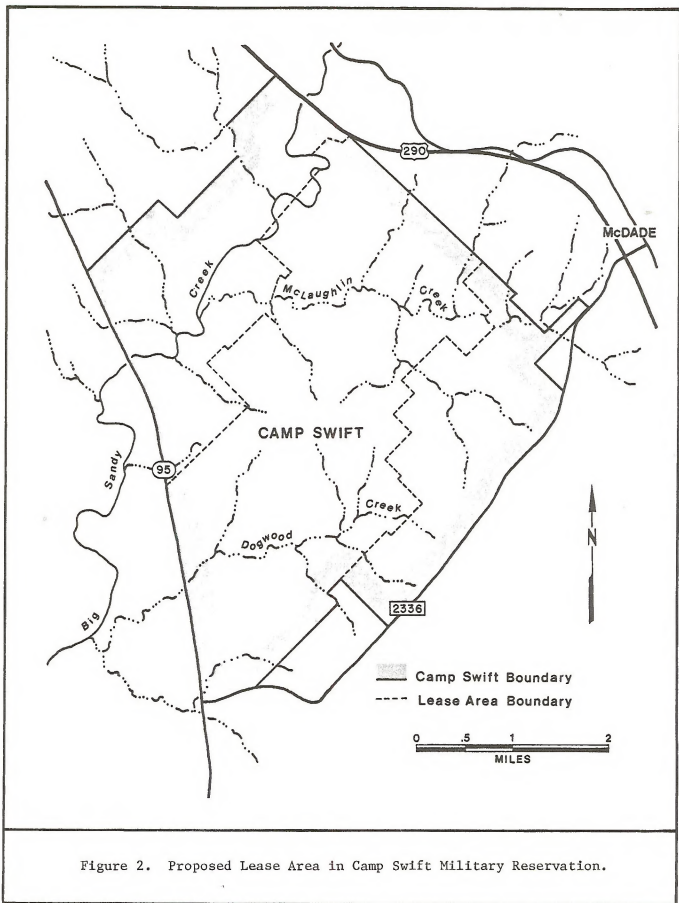


Figure 2. Proposed Lease Area in Camp Swift Military Reservation.

## SECTION 2

### METHODS

During biological data collection and preparation of the Preliminary Draft Environmental Impact Statement, numerous sources were contacted and other material collected pertaining to the three endangered species reviewed for this report. Although literature was used extensively in this review, opinions were also solicited from knowledgeable persons familiar with these species and the Camp Swift area. Therefore, contact with Texas Parks and Wildlife Department (TPWD) and FWS was essential for completion of this report. Persons contacted and summaries of the information developed are included in the Appendix. Literature sources reviewed are cited in the Bibliography.

SECTION 3  
ANALYSIS AND CONCLUSIONS

3.1 HOUSTON TOAD - NO EFFECT

The Houston toad (Bufo houstonensis) is endemic to the central and southeast portion of Texas. Populations occurring in the Houston area have been extirpated, and the only known populations are now found in Bastrop and Burleson Counties in central Texas. This species has been listed as Endangered by the FWS throughout its range (35 FR 16047), and Critical Habitats defined to protect populations of these species in the two counties named above (43 FR 4022). The Burleson County habitat is considerably removed from the proposed lease area (68 kilometers) and is not further considered in this analysis. Critical Habitat in Bastrop County occurs 2.4 kilometers (1.5 miles) south of the proposed lease area (1.6 kilometers in the larger area alternative). The location is shown in Figure 3.

This species is a small anuran amphibian reaching a maximum length of about 7.5 cm (3 inches) measured from nose to rump. It is extremely secretive and seldom observed except during breeding season (FWS Undated). This species is most easily recognized by its distinctive, high-pitched mating call, and is also identifiable during the larval (tadpole) stage. Mating usually occurs in the early spring (February or early March) if sufficient rainfall occurs. Failure of early spring rainfall to fill the temporary pools required by this species for larval development may postpone annual breeding as late as June. This species is adapted to using temporary pools in upland areas. Mating of this species in permanent water bodies (stock tanks, etc.) may result in interbreeding with Bufo valliceps and Bufo woodhousei, both of which are common to abundant in the Gulf Coastal Plain in Texas. Hybridization is considered a major threat to the survival of the



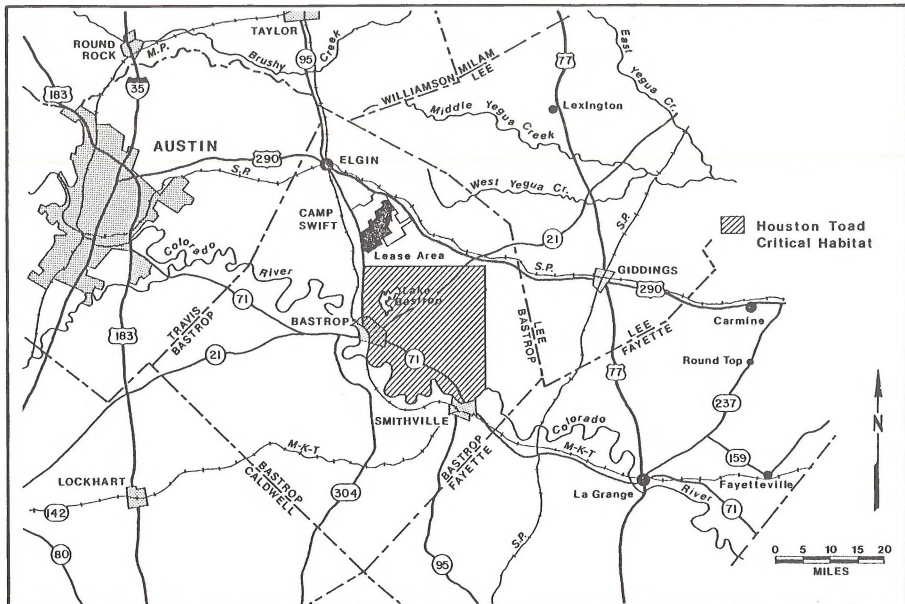


Figure 3. Critical Habitat of Houston Toad in Bastrop County.

Houston toad (FWS Undated). The dependence of this species on deep, sandy soil substrates for hibernation and estivation further restricts this species' available habitat. Hybridization and loss of habitat to land development appear to be the major constraints on survival of this species (FWS Undated).

Two site specific studies indicated that there are presently no individuals of this species in the Camp Swift Military Reservation, and that the nearest known population is 6 to 8 kilometers (4 miles) southeast of the proposed lease area. Martin et al. (1979) completed a field survey during the breeding season to determine presence of this species on the reservation. Field techniques included vocalization/breeding surveys and seining potential breeding pools to determine the presence of B. houstonensis larvae. They found no indications of this species on the proposed lease area. Populations of this species were found in the vicinity of Bastrop. According to Floyd Potter, leader of the Houston Toad Recovery Team, Texas Parks and Wildlife Department, the nearest known population is approximately 6 to 8 kilometers (4 miles) southeast of the proposed lease area (Martin et al. 1979).

Potential habitat for this species in the Camp Swift Military Reservation is apparently either quite restricted or non-existent. Martin et al. (1979) concluded that several small and isolated stands of Loblolly pine (Pinus taeda), a species which may indicate presence of deep sandy soils, are found within the proposed lease area. Two of these, less than 0.8 hectares (2 acres) in size, have been disturbed by military activities. One undisturbed stand, somewhat larger in size, occurs on the border of the proposed lease area. A detailed, site specific survey conducted by TERA Corp. (1978) shows only one stand of Loblolly pine. The stand contains approximately 45 trees. Presence of potential habitat in the proposed lease area is usually considered highly restricted (Potter 1980).

The proposed lease area is not connected to the designated critical habitat for this species by any drainage channels, creeks, or streams. Therefore, changes in stream flow (quality and quantity) potentially

resulting from surface mining activities in the proposed lease area will not affect either the critical habitat or known populations of this toad.

The relative paucity of potential habitat for this toad in the lease area, and the distance to the known populations as well as the designated critical habitat, indicate that the proposed action and alternatives will not affect this endangered species.

### 3.2 BALD EAGLE - NO EFFECT

The Bald eagle (Haliaeetus leucocephalus) previously bred throughout much of the United States. Larger populations were restricted to preferred habitats near coastal areas, larger rivers, and lakes. This species is typically largely dependent on fishing for obtaining food. Nesting sites are either tall trees or cliffs near clear water. Alteration of such habitats has vastly reduced the number of Bald eagles occurring in the continental United States. Concentrations of breeding (nesting) individuals are now restricted to Alaska, British Columbia, and to a lesser extent, Florida (Oberholser 1974). Populations of this species are apparently recovering in several coastal states. Texas currently possesses several small breeding populations along the coastal fringe of the state. This species has been declared Endangered by the FWS in the conterminous United States (32 FR 4001). In Washington, Oregon, Minnesota, Wisconsin, and Michigan (43 FR 6233), it is listed as threatened.

The potential for occurrence of this species within the proposed lease area is considered negligible. Habitat, which is potentially useful for nesting, breeding, or foraging by this species does not exist within the Camp Swift area (Potter 1980). Historical records (Oberholser 1974) indicate that known breeding sites occurred approximately 100 kilometers (60 miles) from the Bastróp area in Austin County and Bell County. Currently, the closest breeding site occurs in Victoria County, approximately 175 kilometers (110 miles) south of the lease area (Potter 1980). No recent sightings of

this species in the Camp Swift area have been made by either Texas Parks and Wildlife personnel (Potter 1980) or local experts (Riddle 1980). The habitat characteristics in the lease area do not meet habitat requirements of this species. Surface water resources, a major habitat requirement, are limited in occurrence within and adjacent to the lease area (TERA Corp. 1978).

The lack of occurrence of both individuals of this species and acceptable habitat in the Camp Swift area resulted in the conclusion that the proposed action and alternatives will not affect this endangered species.

### 3.3 AMERICAN ALLIGATOR - NO EFFECT

The American alligator (Alligator mississippiensis) was formerly quite common throughout the southeastern United States. Historical records indicate that prior to man's usurping their habitat, the alligator extended inland in Texas to a line roughly between Dallas, Austin, and San Antonio (Neill 1971). Current population levels are improving due to protection offered under the Endangered Species Act, as well as numerous restocking programs conducted throughout the southeastern United States. Coastal populations in Texas and Louisiana have recovered sufficiently to permit listing the populations as Threatened under the Endangered Species Act (42 FR 2072). Camp Swift Military Reservation is approximately 160 kilometers (100 miles) inland from the line separating the Threatened coastal populations and the Endangered inland populations.

Optimal habitat for this species is "large shallow lakes, sluggish rivers, fresh and brackish marshes, and wet savannahs of the coastal zone" (BLM 1980). Habitat quality decreases inland from the coast and becomes marginal where water level fluctuations prevent either overwintering or breeding. Migratory invasion upstream into marginal areas may be expected during spring breeding season or in the summer.

The proposed lease area contains little aquatic resources which could be construed as capable of supporting this species. Big Sandy Creek, which skirts the northwestern boundary of the lease area, is considered perennial and might provide such habitat if individuals were present for invasion. A confirmed sighting of this species (Potter 1980) has been made above the confluence of Big Sandy Creek and the Colorado River along Onion Creek in Travis County, approximately 30 kilometers (19 miles) from Camp Swift (area shown in Figure 4). A census of Texas alligators, however, indicates that only 2 percent of Bastrop County could be considered potential alligator habitat, and the estimated population for this county was considered zero (Smith 1975). Alligators are infrequently reported along the Colorado River south of Bastrop, but not to the north (Potter 1980). The probability of this species moving up Big Sandy Creek to the vicinity of Camp Swift (a distance of 8 kilometers) would appear to be remote (Potter 1980).

This species' dependence on stable surface water resources might indicate that loss of water quality would cause adverse affects. Mine dewatering requirements and aquifer depressurization will probably result in a net discharge from the mining operation. Federal and state permit programs controlling discharge characteristics (quality) should sufficiently protect those individuals of this species reported below Bastrop, Texas, a stream channel distance of approximately 30 kilometers (18 miles).

The lack of occurrence of this species in the vicinity of Camp Swift and the paucity of acceptable habitat will exclude effects on the American alligator resulting from the proposed action and alternatives.

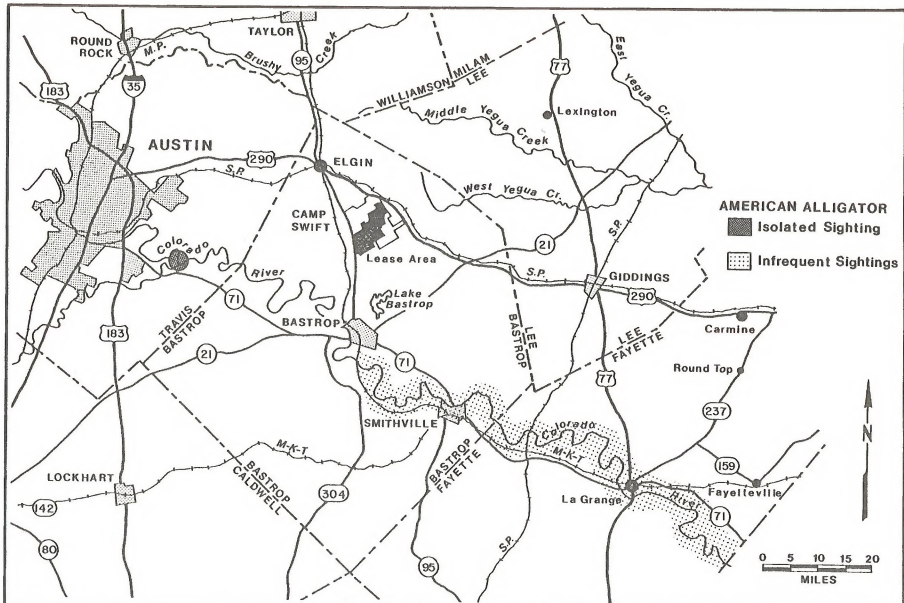


Figure 4. Occurrence of American Alligators: Colorado River Drainage in Central Texas.

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APPENDIX 6  
NOISE CALCULATIONS



APPENDIX 6  
NOISE CALCULATIONS

Noise Calculations - Baseline

The Environmental Protection Agency (EPA) conducted an extensive survey and developed correlative algorithms for estimating noise levels in urban settings. These algorithms apply in the absence of airport and freeway noise as a function of population density (EPA 1974). The regression line describing data correlation is the relationship:

$$L_{dn} = 9.00 \log_{10} P + 25.8 \text{ decibels (dB)}$$

where

$L_{dn}$  = Equivalent day-night sound level in dB

P = Population density.

This computation yields, on a (Bastrop) countywide basis, an  $L_{dn}$  of about 39 dB (22.5 people per square mile) and around Camp Swift about 36 dB (10.7 people per square mile). These levels are probably representative of those that would be measured during periods of no wind and little wildlife or insect activity. Actual experience by acoustic specialists in areas very similar to the Camp Swift setting reveal levels as low as  $L_{dn}$  of 30 dB, but more typically, they range from about 38 to 44 dB.

Noise Calculations - Impacts

Assuming that major sources of noise operate simultaneously in the same area on a 24-hour basis, an estimate of the worst case sound level from mining was made according to the following equation:

$$L_{dn} = 10 \log_{10} (1/24) \left[ 15 \left( 10^{L_d/10} \right) + 9 \left( 10^{\frac{L_n + 10}{10}} \right) \right]$$

Assuming 24 hours of continuous operation, the above expression equals an  $L_{dn}$  of 56 dB at 610 meters (2,000 feet) and 66 dB at 305 meters (1,000 feet) for the equipment items listed in Chapter Three, Table 3-5.

APPENDIX 7

COORDINATION AND CONSULTATION



APPENDIX 7

COORDINATION AND CONSULTATION

CAMP SWIFT EIS SCOPING PROCESS

PUBLIC MEETING, BASTROP, TEXAS

July 19, 1979; 7:00 p.m.

Summary of Issues

The following is a compilation of ideas, concerns, questions, and issues raised during the meeting after a summary of the proposed action and existing information was presented by Carol MacDonald, BLM, NMSO. For clarity and organizational purposes only, the issues raised are presented under eleven broad categories. This in no way reflects the importance of issues nor the order in which they surfaced.

Contracting Procedures:

- What is the cost of contracting an environmental impact statement (EIS)?
- Will the Request for Proposal (RFP) be made available for public inspection?
- How much public input into the RFP can be expected?
- How early in the process of contracting will there be public involvement?
- It was requested that public involvement through the contractor be specified in the RFP, and that the involvement come through public meetings before and during data collection.
- Will the public see the contract proposal prior to formal submission, during the preparation?
- Will the public have access to information on impacts from the contractor?

- Will the contractor be from Texas and be familiar with Camp Swift?

Leasing of the Lignite:

- Who makes the final decision on leasing the lignite?
- Will President Carter's new program emphasizing coal production possibly cut through all the red-tape? If so, will leasing take place without any environmental analysis?
- Who initiated the proposal to lease the lignite?
- Can Bastrop County incorporate with a private mining company and bid on the coal lease?
- Who is eligible to bid on lease?
- Can the Secretary of Interior deny the EIS and lease the lignite on the basis of economics alone?
- Why is expansion of the proposed lease area being considered as an alternative?
- How "competitive" will the leasing be?

Public Involvement:

- What is the process for public involvement?
- Will the public be allowed to visit the proposed site on Camp Swift?  
  
(Note: this question was asked 3 times by 3 different people).
- How much public input can be expected in the EIS?
- The comment was made that Camp Swift was not really public land as the National Guard controlled it and the public was not allowed access.



EIS:

- Does the BLM already have a good grasp on the environmental impacts of the proposed mining without the EIS?
- Does BLM have current examples of public involvement throughout an EIS process with regard to reclamation? What was the public input? What were the results? (Note: This individual requested names, addresses and telephone numbers of Bureau offices where such involvement and results of reclamation could be seen or documentation obtained. This information was provided).
- Will bonding be a requirement to ensure proper reclamation?
- Examples of bad reclamation procedures in Virginia and Kentucky were cited.
- What will be the reclamation requirements?
- Who enforces the reclamation, the Office of Surface Mining (OSM) or the Texas Railroad Commission (TRC)?

Flora and Fauna:

- What is the expected impact on trees and animals?
- Biological concerns were expressed over the following: Camp Swift being a large relatively untouched area with diverse habitats. The Cross Timbers habitat is unique; how will it be affected?
- The effect of mining on existing hydrology will most certainly affect both plants and animals downstream.

State and Local Interests:

- Was the Texas Railroad Commission informed of the public meeting?
- Camp Swift lignite is a county resource, yet the county will receive no tax benefits.
- Bastrop County would like payment in lieu of taxes for the lignite. (Note: this concern was expressed at least 4 times by different people during the meeting).
- A statement was made against a tax-free entity receiving the lease to mine.
- Will any of the royalty monies to be received by the state of Texas from the Camp Swift lease be channeled back into Bastrop County?
- The general statement was made that Bastrop County would like to see the lignite mined provided (1) the environment was fully considered, and (2) that Bastrop County receive some monetary benefit as a result.
- What effect will mining have on property values?

Opposition to Proposal:

- One individual voiced opposition to leasing and mining the Camp Swift area. This opposition was due to a concern over the loss of existing vegetation and wildlife. The use of alternative energy sources was recommended.

- Another comment, while not specifically opposing lignite, did suggest light, clean industry for Bastrop County.

General Concerns:

- A statement was made favoring either LCRA or the City of Austin receiving the lease.
- A suggestion was made to study the possibility of a joint lease venture between the City of San Antonio and LCRA.
- A request was made for an explanation on the differences between coal and lignite.
- A suggestion was made that in order to save fuel, the power plant associated with Camp Swift lignite be located in Bastrop County.
- What will the post-mining land uses be?
- Does the Secretary of Defense have a say into how the lignite will be used?

CAMP SWIFT EIS INTERAGENCY SCOPING MEETING  
AUSTIN, TEXAS - July 20, 1979  
AGENCIES OR GROUPS CONTACTED

Federal Agencies

Advisory Council on Historic Preservation  
Bureau of Mines  
Department of Army, Real Estate Division  
Department of Energy  
Fish and Wildlife Service  
Geological Survey  
Office of Surface Mining and Reclamation  
Soil Conservation Service  
Environmental Protection Agency

State of Texas Agencies

Air Control Board  
Dept. of Water Resources  
Energy Advisory Council  
Governor's Budget and Planning Office  
Historical Commission  
Parks and Wildlife Department  
Railroad Commission  
Department of Health  
Texas National Guard, Adjutant General's Office  
Highways and Public Transportation  
University of Texas, Bureau of Economic Geology  
University of Texas, Office of General Council

Environmental Organizations

Ecology Action  
League of Women Voters  
Nature Conservancy  
Sierra Club  
Texas Committee on Natural Resources  
Texas Environmental Coalition  
Travis Audubon Society  
We Care Austin

Interested Parties

Lower Colorado River Authority  
City of Austin Electrical Utilities Department  
San Antonio Public Service Board

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|                                   |  |
|-----------------------------------|--|
| Air Quality                       | xii, xv, 1-6, 2-3, 3-4, 3-8, 3-26      |
| Climate                           | xv, 3-1                                |
| Cultural Resources                | xv, 1-6, 3-4                           |
| Cumulative Impacts                | 3-26                                   |
| Economic Conditions               | xiii, xvi, 1-22, 2-16, 3-4, 3-19, 3-33 |
| Federal Lands Review              | 1-18, 1-19                             |
| Geology                           | xv, 2-1, 3-1, 3-5                      |
| Hydrology                         | xii, xv, 1-22, 2-4, 3-4, 3-10          |
| Land Use                          | xiii, xvi, 1-15, 1-22, 2-12, 3-4, 3-18 |
| Larger Area Alternative           | xiii, 1-14, 3-25                       |
| Mineral Resources                 | xi, 2-1, 3-1, 3-5, 3-26                |
| Mitigating Measures               | 1-5                                    |
| Net Energy Analysis               | 3-5                                    |
| No Action Alternative             | xiii, 1-14, 3-25                       |
| Noise                             | xiii, xvi, 1-22, 2-17, 3-5, 3-20       |
| Paleontology                      | 1-21, 3-1                              |
| Reclaimability                    | 1-5, 1-11, 3-6,                        |
| Recommendations                   | 1-21, 3-25                             |
| Social                            | xiii, 1-22, 2-16, 3-4, 3-19, 3-33      |
| Soils                             | xii, xv, 1-21, 2-1, 3-1, 3-6           |
| Threatened and Endangered Species | xvi, 3-4                               |
| Transportation                    | xvi, 1-6, 1-9, 1-13, 1-22, 3-5         |
| Unsuitability Criteria            | 1-18, 1-19                             |
| Vegetation                        | xvi, 1-21, 3-4                         |
| Visual Resources                  | xvi, 1-5, 2-12                         |
| Wildlife                          | xvi, 1-21, 3-4                         |

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