1997

Final Environmental Impact Statement Cave Gulch-Bullfrog-Waltman Natural Gas Development Project, Natrona County, Wyoming

United States Department of the Interior Bureau of Land Management

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U.S. Department of the Interior
Bureau of Land Management
Casper District Office

Platte River Resource Area

June 1997

FINAL
Environmental Impact Statement
Cave Gulch - Bullfrog - Waltman
Natural Gas Development Project
Natrona County, Wyoming
The Bureau of Land Management is responsible for the balanced management of the public lands and resources and their various values so that they are considered in a combination that will best serve the needs of the American people. Management is based upon the principles of multiple use and sustained yield, a combination of uses that take into account the long term needs of future generations for renewable and nonrenewable resources. These resources include recreation, range, timber, minerals, watershed, fish and wildlife, wilderness and natural, scenic, scientific and cultural values.

Dear Reader:

This Final Environmental Impact Statement (FEIS) on the proposed Cave Gulch-Bull tryn-Natural gas Development Project is submitted for your review and comment. As a supplement to the draft FEIS, published in February 1997, this volume contains a revised Executive Summary; corrected and new materials in an Addendum and Errata section; an expanded Consultation and Coordination section to include the comment letters received on the draft FEIS and BLM's responses to those comments, and added Appendix.

Because this is an abbreviated final, this document and the draft FEIS, with all of its attendant technical reports and resource studies, comprise the entire document for filing purposes and for the decision making process. Please refer to the draft for more detailed analysis and description of the proposed action and alternatives.

Written comments will be considered in the decision if they are received within 30 days of the Environmental Protection Agency (EPA) Federal Register publication of the Notice of Availability of the Cave Gulch-Bulltry-Natural gas Development Project FEIS. The anticipated publication date is June 20, 1997. Copies of the FEIS may be obtained upon request from the Bureau of Land Management, Casper District Office. The technical reports and other supporting materials are available for inspection also at the Casper District Office.

This FEIS is not the decision document. The decision on the proposed natural gas infill development and associated rights-of-way will be based upon the analysis in the draft and final EIS, public concerns and comments, and other multiple-use resource objectives or programs that apply to the project. A Record of Decision (ROD) detailing the decision of the BLM and its rationale for the decision will be prepared and distributed following the end of the 30-day review period. Presently the ROD is anticipated to be available for release August 4, 1997.

Comments on the content of this FEIS should be sent to:

Kate Padilla, Project Coordinator
Bureau of Land Management
1701 East 4th Street
Casper, Wyoming 82001

The BLM appreciates the individuals, organizations, Federal, State, and local governments who participated in the environmental analysis process. Your involvement has enhanced the integrity of the EIS and the public land manager's ability to make an informed decision.

Sincerely,

Alan E. Pierson
State Director

Attachment
DEPARTMENT OF THE INTERIOR

FINAL ENVIRONMENTAL IMPACT STATEMENT

on the

CAVE GULCH-BULLFROG-WALTMAN NATURAL GAS DEVELOPMENT PROJECT

Natrona County, Wyoming

June 1997

Prepared By:

The Environmental Impact Statement was prepared by Holsan Environmental Planning and Hayden-Wing Associates environmental consulting firms, with the guidance, participation, and independent evaluation of the Bureau of Land Management (BLM). The BLM, in accordance with Federal regulation 40 CFR 1506.5(a) & (b), is in agreement with the findings of the analysis and approves and takes responsibility for the scope and content of this document.

Wyoming State Director

Cave Gulch-Bullfrog-Waltman Natural Gas Development Project

Natrona County, Wyoming

ENVIRONMENTAL IMPACT STATEMENT

[X] Final

Lead Agency:
U.S. Department of the Interior, Bureau of Land Management

Cooperating Agencies:
None

Counties That Could Be Directly Affected:
Natrona County, Wyoming

Abstract:

The Final EIS in combination with the previously released Draft EIS and associated technical support documents analyze a proposal by the Cave Gulch-Bullfrog-Waltman operators to continue to drill additional development wells in their leased acreage within the Cave Gulch-Bullfrog-Waltman natural gas development area (approximately 25,093 acres) of central Wyoming. The Cave Gulch-Bullfrog-Waltman operators include Barrett Resources Corporation, Chevron USA Production Company, Marathon Oil Company, Prima Oil and Gas Company, and other oil and gas companies (collectively referred to as the Operators).

The Cave Gulch-Bullfrog-Waltman project is located in Natrona County, Wyoming. The project area is generally located within Townships 36 and 37 North (T36-37N), Ranges 86 and 87 West (R86-87W), 6th Principal Meridian. The area is accessed by U.S. Highway 20/26 west from Casper, Wyoming to Waltman, Wyoming. Access to the interior of the project area is provided by Natrona County Road No. 104 north from Waltman, and an existing road network developed to service prior and ongoing drilling and production activities.

The Operators propose to drill and develop approximately 160 natural gas wells on 107 well sites over the next ten-year planning period (1996-2006) within the Cave Gulch-Bullfrog-Waltman Natural Gas Development area. The proposed development is in addition to approximately 42 wells that have been drilled and developed or abandoned in the project area. The precise number of additional wells, locations of the wells, and timing of drilling associated with the proposed natural gas development project would be directed by the success of development drilling and production technology, and economic considerations such as the cost of development of leases within the project area with marginal profitability.
This EIS analyzes the impacts of the Proposed Action, alternatives to the Proposed Action, and the No Action Alternative. The EIS describes the physical, biological, cultural, historic, and socioeconomic resources in and surrounding the project area. The focus for impact analysis was based upon resource issues and concerns identified during public scoping.

Potential impacts of concern from development are to recreation and visual impacts associated with the South Bighorn/Redwall National Backcountry Byway; raptor breeding and nesting habitat and populations; special status plant and wildlife species; soil erosion and sediment increases within the project area; impacts to air quality; socioeconomic impacts to Natrona County; and cumulative effects.

Other Environmental Review or Consultation Requirements:

This EIS, in compliance with Section 7 of the Endangered Species Act (as amended), includes the Biological Assessment for the purpose of identifying any endangered or threatened species which are likely to be affected by the proposed action.

Lead Agency Contact:

For further information, contact Kate Padilla at the Casper District Office, (307) 261-7603.

EIS Contact:

Kate Padilla, Project Coordinator
Casper District Office
1701 East "E" Street
Casper, Wyoming 82601

Date EIS Made Available to EPA and Public:

Draft: February, 1997
Final: June 17, 1997
Final EIS Comments Must Be Received By: July 20, 1997
PREFACE

The purpose of this Final environmental impact statement (EIS) for the Cave Gulch-Bullfrog-Waltman Natural Gas Development Project is to supplement the Draft EIS which was published in February 1997. Reviewed together, the Draft and Final EISs incorporate the description of the proposed project, other alternatives including the "No Action" alternative, the affected environment, as well as the analyses of potential environmental consequences resulting from construction, operation, and abandonment of the proposed project. This Final EIS should not be considered as a complete EIS, nor as a decision document. This FEIS is organized into six sections:

- **Section 1. Executive Summary** - Information presented in this section describes the NEPA process utilized in the analysis, briefly describes the Proposed Action and alternatives, provides a summary of the resource elements analyzed and a summary of their cumulative effects, and describes the agency-preferred alternative.
- **Section 2. Addendum and Errata** - Provides an addendum of additional discussion and studies which have been completed to address comments received during the comment period on the draft EIS. It also includes an errata section showing changes in the text of the Draft EIS which resulted from public comment.
- **Section 3. Consultation and Coordination** - Summarizes the consultation and coordination that occurred during the preparation of the Cave Gulch-Bullfrog-Waltman EIS and background information regarding the consultation and coordination process.
- **Section 4. Comment Letters Received on the Draft EIS** - Provides a copy of the public comment letters received on the draft EIS.
- **Section 5. Response to Comments** - Provides BLM's responses to those comments shown in Section 4.
- **Appendix** - One appendix not included with the draft EIS is provided in this final EIS. Appendix A contains the Cumulative Air Quality Impact Analysis Technical Support Document Addendum.

In response to comments received concerning cumulative impacts to air quality from the reasonably foreseeable implementation of the Cave Gulch-Bullfrog-Waltman and other projects, the BLM, through the expertise of the firm TRC Environmental Consulting, Inc., has supplemented the air quality sections of the draft EIS with a more comprehensive air quality cumulative impact analysis addressing the construction and operation phases of oil and gas development. The Appendix A item of this final EIS expands upon the cumulative impact analysis found in the draft EIS. The details of the Draft EIS analysis are available in a separate Technical Support Document entitled "Cumulative Air Quality In-impact Analysis". A copy of the technical report can be reviewed at the Bureau of Land Management, 1701 East "E" Street, Casper, Wyoming 82001. It is also available for review at the BLM State Office Cheyenne, Wyoming. A preliminary technical review of the Technical Support Document was conducted by the U.S. Environmental Protection Agency, Wyoming Department of Environmental Quality-Air Quality Division, and U.S. Forest Service Bridger-Teton National Forest. Concurrency in the scope, content, and analysis procedure contained in the Technical Report was provided by these agencies.

The draft and final EISs have been prepared according to the requirements of the National Environmental Policy Act of 1969 (NEPA) and the Council on Environmental Quality's regulations for implementing NEPA, effective July 30, 1979.

The analyses were based on a proposed schedule and highest potential level of development contained in the draft EIS. As the project is implemented, the impacts will be evaluated to determine if they fall within the parameters discussed in the draft and final EISs. Any major change in project design would require additional environmental analysis.
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<td>oxides of nitrogen</td>
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<td>microequivalents per liter</td>
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SECTION 1:

EXECUTIVE SUMMARY
EXECUTIVE SUMMARY

1.0 INTRODUCTION

This Final Environmental Impact Statement (FEIS) analyzes the impacts of drilling and production operations in the Cave Gulch-Bullfrog-Waltman natural gas producing area of central Wyoming (Figure 1-1). The Cave Gulch-Bullfrog-Waltman project area is located in Natrona County, Wyoming within Townships 36 and 37 North (T36-37N), Ranges 86 and 87 West (R86-87W), 6th Principal Meridian. The project area encompasses approximately 25,093 acres of mixed federal, state, and private lands. Of this total, approximately 7,375 acres are managed by the U.S. Department of the Interior (USDI) Bureau of Land Management (BLM). 1,244 acres are managed by the State of Wyoming, and 16,474 acres are private lands. Also, within the project area, 76.5 percent of the mineral estate is federal (19,182 acres) administered by the BLM, 3.2 percent is State (806 acres), and 20.3 percent is private (3,105 acres).

This FEIS has been prepared pursuant to the National Environmental Policy Act (NEPA) and addresses three field development scenarios (Proposed Action, Alternative A, and Alternative B), and a “No Action” alternative. Details on the Proposed Action and alternatives are described in the DEIS (USDI-BLM 1997) according to the following chapters. Chapter 1 defines the Purpose and Need for the proposed project. Chapter 2 details the parameters of the Proposed Action and other alternatives as well as providing a summary of proposed mitigation and monitoring measures to avoid or reduce impacts proposed by the project operators. Chapter 3 of the FEIS discusses the areas and resources that would be affected under each alternative. Chapter 4 examines the environmental consequences to each resource under each alternative and also provides a summary of additional mitigation measures by resource discipline which were identified during the analysis process. The measures and requirements in the FEIS describe how implementation of the Proposed Action or alternatives should be managed to assure minimal impacts in the Cave Gulch-Bullfrog-Waltman project area and adjacent lands. Chapter 5 examines the cumulative effects of implementing the Proposed Action and alternatives. Chapter 6 of the FEIS summarizes the consultation and coordination accomplished with various federal, state, county, and local agencies, elected representatives, environmental and citizen groups, the industries, and individuals potentially concerned with issues regarding the proposed drilling action and alternatives.

Management of federal lands within the Cave Gulch-Bullfrog-Waltman project area, including natural gas drilling and development activities, is provided by the Platte River Resource Area Resource Management Plan (RMP) (USDI-BLM 1985). The proposed natural gas development project and alternatives are in conformance with management objectives provided in the RMP, subject to implementation of prescribed mitigation measures.

Following discovery of natural gas in the Cave Gulch Unit in 1994 by Barrett Resources Corporation (Barrett), an environmental assessment (EA) was prepared by the BLM (Barrett Resources Corporation Cave Gulch Area Natural Gas Development Environmental Assessment and FONSI/Decision Record, May 1995). Based on potential environmental impacts contained in the EA, the BLM determined that impacts were not expected to be significant and an EIS would not be required.

Subsequently, Barrett and Chevron on USA Production Company (Chevron) received approval to drill additional wells and construct pipelines within the project area, under provisions provided in the Cave Gulch Area Natural Gas Development Project Environmental Assessment (May 1995).
EXECUTIVE SUMMARY

The BLM issued a decision to vacate the Barrett Cave Gulch decision record in January, 1996 after BLM determined that the mitigation measures upon which the Barrett EA and FONSI were based could not be executed and/or were not sufficient to prevent potential significant impacts from development in the analysis area. A Chevron EA, being prepared for the Bullfrog Unit adjacent to Cave Gulch, was suspended when BLM determined that an EIS was required to assess the direct and cumulative impacts from exploration, development, production, and transportation of the natural gas and associated liquid petroleum products in the Cave Gulch-Bullfrog-Waltman project area.

Drilling attempts within the project area have been successful. As of February 1, 1997, 42 natural gas wells have been drilled in the project area.

The FEIS addresses a Proposed Action and three alternatives as described in greater detail in the following section and briefly summarized here.

- The Proposed Action would increase natural gas production in the Cave Gulch-Bullfrog-Waltman project area by allowing the operators to drill and develop approximately 160 natural gas wells on 107 new and 24 existing well sites, in addition to existing drilling and production operations. The Proposed Action was determined by summarizing drilling plans projected by the Cave Gulch-Bullfrog-Waltman Operators over the next ten-year planning period. Total life expectancy of the Cave Gulch-Bullfrog-Waltman Natural Gas Production Area is estimated by the Operators to be approximately 30 to 40 years. Drilling estimations were based on reasonably foreseeable spacing and drilling projections in areas within the project area where the planned production and development activities would occur, as well as development of related roads, pipelines, and production facilities.

- Alternative A would provide for a reduced density of surface well pads and production facilities. Alternative A would allow the operators to drill and develop approximately 97 new and 2 existing well sites. Within each unit, or within individual leases that are not utilized within the project area, centralized facilities would be constructed for compression, condensate, or water separation and production treatment and storage. This alternative provides for a year-round raptor stipulation for selected nests and increased distance of the seasonal raptor stipulation for the selected ferruginous hawk nests. Under Alternative A, casual use and unusual maintenance activities would be managed during key raptor nesting periods.

- Alternative B would allow the operators to drill and develop approximately 114 new well sites. Under Alternative B, a proposed area adjacent to the project area would be managed as a Key Raptor Area (KRA). Development of existing leases would be subject to a seasonal raptor nesting restriction unless or until field development is proposed. If oil and gas field development is proposed within the KRA, the year-round buffer, increased seasonal buffer, and unusual maintenance stipulations would have to be evaluated in an environmental assessment and selected in the decision document before being implemented. Casual uses, such as those associated with recreation, would not be managed specifically, unless there were documented disturbances to raptor nesting.

- Alternative C, the No Action Alternative, implies that Applications for Permit to Drill (APDs) and right-of-way (ROW) actions would be granted by the BLM on a case-by-case basis through individual project and site-specific environmental analyses.

Under any of the alternatives, development could occur on State and private lands within the analysis area under authorizations granted by the Wyoming Oil and Gas Conservation Commission (WOGCC).

EXECUTIVE SUMMARY

The Cave Gulch-Bullfrog-Waltman Natural Gas Development Project EIS was prepared by a third party contractor working under the direction of, and in cooperation with the lead agency for the project, which is the Bureau of Land Management (BLM), Casper District Office, Casper, Wyoming.

1.1 PROPOSED ACTION AND ALTERNATIVES

1.1.1 Proposed Action

The Proposed Action would provide a maximum development scenario of approximately 160 natural gas wells on 107 new well sites and 24 enlarged existing well sites with related facilities over the next 10-year planning period (1996-2006) within the Cave Gulch-Bullfrog-Waltman Natural Gas development area. The proposed development is in addition to approximately 42 wells that have been drilled and developed or abandoned in the project area.

The Proposed Action was divided into four planning areas as shown on Figure 2-1 and discussed in Section 2.1.1 (Proposed Action) in the DEIS. The four planning areas were used by the Operators to better define drilling densities that would be necessary for maximum recovery of the natural gas resource. The precise number of new wells, locations of the wells, and timing of drilling would be directed by the success of development drilling and production technology, and economic considerations such as the cost of development of leases having marginal profitability. This proposed development level would also provide consideration of topographic and environmental limitations within the project area.

Construction of the Proposed Action would involve 313.45 acres of well pad disturbance, 250.02 acres of new road disturbance, 183.92 acres (37.93 miles) of cross-country pipeline disturbance, and 35 acres of ancillary facility disturbance, for a total of approximately 788.39 acres. Approximately 50 percent of this disturbed area would be reclaimed. Disturbances associated with well pads would be reduced by reclaiming cut, fill, and soil stockpiling areas. This would represent an approximate reduction of 82.45 acres for all new well pads and 128.01 acres for outside road ditches. All cross-country pipeline ROWs would be reclaimed representing an approximate reduction of 183.92 acres of disturbed area, thus reducing the total disturbance by 394.38 acres to 394.01 acres. The technical requirements for the Proposed Action are described in detail in the DEIS, Chapter 2, Section 2.2.

1.1.2 Alternative A

Alternative A would allow the Operators to drill and develop approximately 97 new well sites and enlarge 2 existing well sites, with related facilities over the 10-year planning period. Development under Alternative A is in addition to approximately 42 wells that have been drilled and developed or abandoned in the project area. Within each unit, or within individual leases that are not unified within the project area, centralized facilities would be constructed for compression, condensate, or water separation, and production treatment and storage. This alternative provides for 150-acre raptor stipulation for selected nests and increased distance of the seasonal raptor stipulation for the selected ferruginous hawk nests. Under Alternative A, casual use and unusual maintenance activities would be managed during key raptor nesting periods.

The technical requirements for Alternative A, including the project-wide mitigation measures, are the same as described for the Proposed Action. The construction of this alternative would involve 268.35 acres of well pad disturbance, 223.88 acres of new road disturbance, 142.78 acres of cross-
country pipeline disturbance, and 35 acres of ancillary facility disturbance, for a total of approximately 870.01 acres. A large portion of this area would be reclaimed as described under the Proposed Action, thus reducing the total disturbance by 362.97 acres to 307.04 acres.

1.1.3 Alternative B

Alternative B would allow the operators to drill and develop approximately 114 new well sites with related facilities over the 10-year planning period. Under Alternative B, a proposed area adjacent to the project area would be managed as a Key Raptor Area. Development of existing leases would be subject to a seasonal raptor nesting restriction unless or until field development is proposed. If oil and gas field development is proposed in the proposed KRA, the year-round buffer, increased seismic buffer, and unusual maintenance stipulations would have to be evaluated in an environmental assessment and selected in the decision document before being implemented. Casual uses, such as those associated with recreation, would not be managed specifically, unless there were documented disturbances to raptor nesting.

The technical requirements for Alternative B, including the project-wide mitigation measures, are the same as described for the Proposed Action. The construction of this alternative would involve 313.50 acres of well pad disturbance. 295.86 acres of new road disturbance. 163.35 acres of cross-country pipeline disturbance, and 35 acres of ancillary facility disturbance, for a total of approximately 788.71 acres. A large portion of this area would be reclaimed as described under the Proposed Action, thus reducing the total disturbance by 420.28 acres to 348.43 acres.

1.1.4 Alternative C - No Action

Alternative C, the "No Action" alternative, implies that the on-going natural gas production activities would be allowed to continue by the BLM in the Cave Gulch-Bullfrog-Waltman project area, but the Proposed Action and Alternatives A and B would be disallowed. Additional APDs and ROW actions would be granted by the BLM on a case-by-case basis. Additional APDs and ROW actions would be allowed from those wells within the analysis area that are currently productive.

1.1.5 Major Impact Conclusions

The Cave Gulch-Bullfrog-Waltman Natural Gas Development project could cause direct and indirect, short-term and long-term, as well as cumulative disturbance of the human and natural environments. Potential environmental impacts that could result from implementation of the Proposed Action and Alternatives A and B are detailed in Chapter 4 of the DEIS. A summary of the proposed mitigation and monitoring measures to avoid or reduce impacts as committed by the Cave Gulch-Bullfrog-Waltman operators is presented in Chapter 2 of the DEIS. Chapters 4 and 5 summarize the environmental impacts for each resource discipline and mitigation measures identified to avoid or reduce the impacts, which were identified during the analysis process and which are summarized below.

2.0 RESOURCE ELEMENTS ANALYZED

2.1 Geology/Minerals/Paleontology

Implementation of the Proposed Action and Alternatives A, B and C would result in construction excavation associated with the development of well pads, access roads, pipelines and other production facilities which could directly result in the exposure and damage or destruction of scientifically significant fossil resources. The potential magnitude of impact to fossil resources associated with the action alternatives (the Proposed Action and Alternatives A and B) varies proportionally with the total number of wells which would be developed under each alternative. The magnitude of impact for Alternative C - No Action, which would allow additional APDs and ROW actions on a case-by-case basis, is unknown at present and would depend on the specific action taken and the specific area involved. Potential for impacts to project facilities as a result of seismic activity is low, as is the potential for landslides and road subsidence that would temporarily close access roads. No significant impacts to important surface resources or other geologic resources would occur under the Proposed Action. Mitigation measures discussed in Chapters 2 and 4 should reduce potential impacts to geologic/paleontologic resources.

Beneficial impacts under the action alternatives include the unanticipated discovery of previously unknown fossils which could occur as a result of construction anywhere in the analysis area.

Under the Proposed Action and Alternatives B and C, maximum ultimate recovery of the oil and gas reserves should be attainable. Under Alternative A, an estimated 54.9 bcf of gas could not be recovered from within the raptor nest buffer areas because those areas could not be drained by existing or new Alternative A wells.

2.2 Air Quality

Extensive analyses were performed to determine potential direct, indirect and cumulative air quality impacts from the Proposed Action and Alternatives for the Cave Gulch-Bullfrog-Waltman Natural Gas Development Project (as detailed in the "Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis").

Although some deterioration of air quality would occur, potential impacts were not predicted to be significant. Short-term, local air quality degradation would occur due to site preparation and construction activities (involving particulate matter, sulfur dioxide, and hazardous air pollutants). Long-term, cumulative air quality degradation (due primarily to direct carbon monoxide and nitrogen dioxide emissions, and potential secondary ozone formation) would occur primarily due to compression, dehydration, separators, and storage tank operation. Findings of the extensive analyses include:

- Construction and operation would meet all applicable National Ambient Air Quality Standards (NAAQS) and Wyoming Ambient Air Quality Standards (WAQAS).
- Pollutant concentrations during operation would not significantly "overlap" between well locations, even with the densest assumed well spacing. That is, the maximum ground level concentrations occurred so close to each well that adding additional wells in the field would not increase the maximum concentration.
- Construction and operation impacts would be below applicable significance criteria for atmospheric deposition at the Cloud Peak Class II Wilderness Area.
- Assuming conservative "worst-case" emissions and modeling assumptions, operations would not result in any perceptible visibility impact on the cleanest days at the Cloud Peak Class II Wilderness Area.

The conservative "worst case" emission assumptions represent an upper bound which would not be exceeded. Review of current production activities in the area suggests this level of emissions...
and potential impacts would not be reached. For example, the “worst case” emissions scenario assumes: (1) all of the potential sites become producing wells (e.g., no “dry holes”); (2) all producing wells would be operational for 10 to 20 years; and (3) all production activity occurs at the maximum assumed emission rate continuously.

Also, before actual development would occur, the Wyoming Department of Environmental Quality, Air Quality Division (WDEQ/AQD) requires air quality permits which would examine expected emissions from specific project components (such as compressors and certain wells) prior to their construction.

Additional site specific air quality analysis will be performed, and additional emission control measures may be required, to ensure protection of air quality resources. Therefore, predicted impacts should be viewed as a conservative upper bound estimate of potential air quality effects that are not likely to occur.

Air Quality impacts associated with the Proposed Action and alternatives is summarized as follows:

**Proposed Action - Construction-related Impacts**
- No violation of Wyoming or Federal standards; Slight higher fugitive dust and sulfur dioxide levels.

**Proposed Action - Production-related Impacts**
- No violation of Wyoming or Federal standards; Slight higher carbon monoxide, nitrogen dioxide, and ozone levels. No significant visibility or atmospheric deposition impacts at the Cloud Peak Class II Wilderness Area.

**Alternatives A and B - Construction-related Impacts**
- No violation of Wyoming or Federal standards; Slight higher fugitive dust and sulfur dioxide levels.

**Alternatives A and B - Production-related Impacts**
- No violation of Wyoming or Federal standards; Slight higher carbon monoxide, nitrogen dioxide, and ozone levels. No significant visibility or atmospheric deposition impacts at the Cloud Peak Class II Wilderness Area.

**Alternative C - No Action - Construction-related Impacts**
- No violation of Wyoming or Federal standards. Because specific development actions are unknown, potential impacts can not be evaluated at this time. However, under FLPMG and the Clean Air Act, the BLM can not conduct or authorize any activity which does not conform to all applicable local, State or Federal air quality laws, statutes, regulations, standards or implementation plans.

**Alternative C - No Action - Production-related Impacts**
- No violation of Wyoming or Federal standards. Because specific development actions are unknown, potential impacts can not be evaluated at this time. However, under FLPMG and the Clean Air Act, the BLM can not conduct or authorize any activity which does not conform to all applicable local, State or Federal air quality laws, statutes, regulations, standards or implementation plans.

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Clean Air Act, the BLM can not conduct or authorize any activity which does not conform to all applicable local, State or Federal air quality laws, statutes, regulations, standards or implementation plans.

**2.3 Soils**

Impacts resulting from drill pad, access road, and pipeline ROW construction could include removal of vegetation, exposure of the soil, mixing of soil horizons, soil compaction, loss of topsoil productivity, and increased susceptibility of the soil to wind and water erosion.

Implementation of the Proposed Action would result in a total of 789.39 acres of disturbance. Assuming avoidance of sensitive soils to the maximum extent practicable, effective surface run off, erosion, and sedimentation control combined with effective revegetation would reduce the severity of adverse impacts to non-significant levels. Alternative A would involve a reduced level of disturbance from the Proposed Action and would involve 670.01 acres of disturbance. Alternative B would involve a reduced level of disturbance from the Proposed Action, but greater than Alternative A and would involve 768.71 acres of disturbance. Alternative C, No Action, would result in the least impacts of all alternatives except that individual POGs could continue to be approved by the BLM resulting in impacts approaching the magnitude of the action alternatives. However, there would be an increased probability of occurrence of unexpected adverse impacts since overall field development would not happen in a well-planned out manner.

Alternative B (559.94 acres) would involve more disturbance in sensitive soils than the Proposed Action (549.08) and Alternative A (461.82 acres). Similarly, Alternative B (321.80 acres) would involve more disturbance in soils with a poor or very poor reclamation potential than the Proposed Action (302.70) and Alternative A (317.80 acres). Thus, Alternative B would potentially be the more damaging of the action alternatives in this regard.

Both the Proposed Action and Alternative B would involve siting of project facilities in areas of slope gradients greater than 25 percent. This could lead to significant impacts in regard to increased surface run off, erosion, and sedimentation, as well as reclamation problems.

In regard to the amount of construction disturbance located in each of the nine watersheds, the Main Branch of Cave Gulch would sustain the most development pressure under each alternative. The Proposed Action and Alternative B would involve no increased level of disturbance in the South Branch of Cave Gulch. Significant cumulative impacts could occur in the Waltnan Draw and Main Branch of Cave Gulch watersheds in the short term during construction, but total disturbance would be below the 10 percent threshold in the long-term production phase. Erosion impacts would follow a similar trend of magnitude commensurate with the area of disturbance associated with each alternative. Erosion modeling was used to evaluate the effectiveness of surface run off, erosion, and sedimentation control measures, as well as reclamation measures. Assuming best management practices would be applied effectively, no significant erosion or sedimentation impacts would likely occur.

The analysis of direct and indirect impacts indicates that significant impacts could occur under each of the action alternatives as well as the No Action alternative. Mitigation would be required to avoid such significant impacts. Under the RMP management directives, a watershed management plan could be necessary for the Cave Gulch drainage since adverse cumulative impacts could be significant in the short term.
2.4 Water Resources

Potential impacts that could occur due to the proposed project include increased surface water runoff and off-site sedimentation due to soil disturbance, increased salt loading and water quality impacts from surficial drainage of soils, and channel morphology changes due to reduced riparian wetland alteration. The magnitudes of impacts to water resources would depend on the proximity of the disturbance to the drainage channel, slope aspect and gradient, degree and area of soil disturbance, soil characteristics, and duration of time within which construction activities would occur and the time of year mitigation measures are implemented and success/failure of mitigation measures. Impacts would likely be greatest shortly after the start of construction activities and would likely decrease in time due to natural stabilization, reclamation, and revegetation efforts. Construction activities would occur over a relatively short period (probably within a 10-year period), therefore, the majority of the disturbance would be intense but short-lived. Petroleum products and other chemicals could be accidentally spilled resulting in surface and groundwater contamination. Similarly, reserve and evaporative pits could leak and degrade surface and groundwater if liners were punctured or were not installed. Authorization of the proposed project would require full compliance with RMP management directives that relate to surface and groundwater protection. Executive Order 11988 (flood plains protection), and the Federal Clean Water Act (CWA) in regard to protection of water quality and compliance with Section 404.

Most adverse impacts to water resources could be avoided or reduced through implementation of control measures identified in Chapter 2. Mitigation listed in Chapters 4 and 5, Appendix A, and Appendix B. The Proposed Action would result in the greatest area of disturbance 788.39 acres, followed by Alternative B, 788.71 acres, with Alternative C causing the least disturbance, 670.01 acres. Alternative No Action would result in the least impact overall except that individual PDs could continue to be approved by the BLM resulting in impacts approaching the magnitude of the action alternatives. However, there would be an increased probability of occurrence of unexpected adverse impacts since overall field development would not happen in a well-planned manner.

Alternative B (559.94 acres) would involve more disturbance in sensitive soils than the Proposed Action (549.08 acres) and Alternative A (461.82 acres) where impacts to water resources could be avoided or reduced. The Proposed Action and Alternative B would involve sting operations in areas of slope gradients greater than 25 percent. This could lead to significant impacts in regard to increased surface runoff, erosion and sedimentation, as well as reclamation problems. As discussed in Section 4.3.3.3, the Main Branch of Cave Gulch would sustain the most development pressure under each alternative. The Proposed Action and Alternative B would involve an increased level of disturbance in the South Branch of Cave Gulch. Significant cumulative impacts could occur in the Wallow Draw and Main Branch of Cave Gulch watersheds in the short term during construction, but total disturbance would be below the 10 percent threshold in the long production phase. Demand on surface and groundwater for use during project construction, well drilling, and testing of pipelines would be small since such water would be used over several years and no surface water or groundwater rights would be adversely affected. Most other types of adverse impacts would be essentially the same for each of the action alternatives. The analysis of direct and indirect impacts indicates that significant impacts could occur under each of the action alternatives as well as the No Action alternative. Mitigation would be required to avoid such significant impacts.

2.5 Vegetation/Wetlands

Direct impacts would include the short-term loss of vegetation (modification of structure, species composition, and areal extent of cover types). Indirect adverse impacts would include the short-term and long-term increased potential for weed invasion, establishment, and expansion; exposure of soils to accelerated erosion; shifts in species composition and/or changes in vegetation density away from a more desirable condition (e.g., native communities); a loss of natural biodiversity; reduction of wildlife habitat, and changes in visual aesthetics.

Impacts to vegetation include removal of cover types and the potential for noxious weed invasion. Except for waters of the U.S. (including wetlands) and special status plant species and their habitat, disturbance of vegetation cover types would not be minimal because wind types are common, have high frequencies of occurrence, cover large areas, and have wide distribution. However, construction in badland areas could have serious erosion and site stabilization consequences as discussed under Soils in the DEIS. Any construction activities that result in placing fill or removing material from wetlands areas or other waters of the U.S. would be important. Measures imposed by the Section 404 permitting process would reduce or avoid impacts to jurisdictional wetlands and remove the potential for significant impacts. In spite of the sandy nature of the soils in many locations, the technology exists to disturb areas to predisturbance conditions. As described in the DEIS, Chapter 4, Section 4.5, due to the poor reclamation potential, locating roads, well sites and facilities outside of badland areas would avoid adverse impacts to those areas. If impacts cannot be avoided, site-specific design and/or relocation of the proposed well sites would reduce the potential for negative impacts to this cover type. No significant impacts would occur to special status plant species or their habitat with avoidance and mitigation measures implemented as determined appropriate by the BLM. Weed invasion and establishment would be a major concern of project development. Careful monitoring and eradication and control measures would be required to minimize the spread of such unwanted species. No significant cumulative impacts would occur with implementation of the action alternatives or the No Action alternative if identified mitigation measures are employed.

2.6 Range Resources and Other Land Uses

Implementation of the Proposed Action would result in 313.45 acres of well pad disturbance. This disturbance, combined with new road and pipeline construction (439.94 acres), and ancillary facility construction (35 acres) would result in an estimated total disturbance of 788.39 acres of forage production during the initial stages of the project. Depending on the actual locations of the well sites with respect to forage productivity, lost forage during drilling, access road, and pipeline construction would vary between 98.63 and 37.6 AUMs, with an average of 92.8 AUMs (short-term loss of forage). Following reclamation and re-establishment of suitable range forage, approximately 394.01 acres (46.35 AUMs) of forage production could be removed from the livestock use (long-term loss of forage). This would be a reduction of about 1.57 percent of the current livestock forage use in the project area. Overall, this level of reduction should not affect the livestock use in the project area, unless the well sites and associated facilities are located predominately on a select few permits and/or are located on areas where forage production is greater than average in the project area.

Implementation of Alternative A would result in the disturbance of approximately 670.01 acres (78.82 AUMs) in the short-term (initial construction and production phases). Following reclamation, approximately 307.04 acres (38.12 AUMs) would remain out of forage production. This represents a loss in stocking levels of about 1.22 percent throughout the Cave Gulch-Bullfrog-Wallman Project Area in the long-term. Overall, this level of reduction should not affect the livestock use in the project area, unless the well sites and associated facilities are located predominately on a select few permits and/or are located on areas where forage production is greater than average in the project area.
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Under Alternative B, approximately 768.71 acres (90,44 AUMs) would be disturbed in the short-term (initial construction and production phases). Following reclamation, approximately 348.43 acres (40.99 AUMs) would remain out of forage production. This represents a loss in stocking levels of about 1.39 percent throughout the Cave Gulch-Bulldog-Waltman Project Area in the long-term. Overall, this level of reduction should not affect the livestock use in the project area, unless the well sites and associated facilities are located predominately on a select few permitees and/or are located on areas where forage production is greater than average in the project area.

Alternative C would result in on-going site disturbance with an associated loss in forage production. The amount of forage production lost is unquestionable since the anticipated level of development is not known.

2.7 Wildlife

The implementation of the Proposed Action or Alternative A, B or C would result in direct losses of potentially crucial big game species, sage grouse, and general wildlife habitat from surface disturbance associated with the construction of pads and related access roads and pipelines. In addition, individuals of some wildlife species would be indirectly impacted by displacement from habitats in the vicinity of the project area due to the presence of human activities associated with the construction and operation of wells. The potential for collisions between wildlife and motor vehicles would also increase due to the construction of new roads and increased traffic levels on existing roads. The severity of these impacts would be expected to decrease with the completion of the construction phase and with the onset of reclamation efforts on many of the disturbed areas.

The acreages of wildlife habitats disturbed under the Proposed Action and Alternatives A and B are 763.665, and 763, respectively, and the Nature of impacts to wildlife is identical. The implementation of prescribed avoidance and mitigation measures (Chapter 4, Section 4.7.5 of the DEIS) as well as additional measures described in Chapter 2, Section 2.2.2.12 would reduce the impact potential and allow for any of the action alternatives to be performed without significant impacts to big game, sage grouse, and general wildlife species.

No impacts to black-footed ferrets are expected due to the lack of suitable habitats on the project area. Mitigation procedures described in the DEIS will ensure that adverse impacts to the mountain plover and swift fox should they be found to occur on the project area, are avoided.

The principal potential impacts of the Proposed Action, Alternative A, and Alternative B on raptors are: (1) nest depredations and/or reproductive failure caused by project related disturbance, (2) temporary reduction of raptor populations, and (3) increased public access and subsequent human disturbance resulting from new road construction. Although the nature of prescribed avoidance and mitigation measures varies considerably between the Proposed Action and alternatives, the application of these measures (Chapter 4, Section 4.7.5), as well as additional measures described in Chapter 2, Section 2.2.2.12, would reduce impact potentials and allow for any of the action alternatives to be performed without significant impacts to raptors.

Essentially the same levels of development as described under the Proposed Action and Alternative B would be allowed under the No Action Alternative. Under the No Action Alternative the consideration of individual APFs on public lands on a case by case basis would be allowed through site-specific environmental analysis, therefore, impacts would be comparable.
badland breaks. In addition, the aesthetic experience of those traveling the South Bighorn/Redwall Backcountry Byway would be diminished by the Proposed Action and alternatives.

2.10 Cultural Resources

Potential impacts to specific eligible or unevaluated properties are unknown at this time. Given the Cave Gulch-Bullfrog-Waltman proposal is in an area of high to moderate site density, development would be likely to encounter significant cultural resources.

In general, the project area has a moderate to high site density, and therefore, high archaeological sensitivity. Certain geomorphic situations have a greater archaeological potential than other areas especially in terms of significant cultural resources. These situations includeolian deposits (sand dunes, sand shadows and sand sheets) and alluvial deposits along major drainages.

None of the cultural resources discovered in the core area are of the type, density or distribution to suggest that there is any potential for the presence of Native American sacred sites or Traditional Cultural Properties. Instead, the known site inventory consists of routine domestic and utilitarian debris which lies well below the threshold of materials that would invoke evaluation as potential Traditional Cultural Properties.

Although the project area has a high degree of archaeological sensitivity, impacts to known cultural properties would not be significant with implementation of the Proposed Action or alternatives. Potential impacts to known and anticipated cultural resources can be alleviated through appropriate mitigation measures.

2.11 Socioeconomics

The employment, income, and tax revenues expected to result from the Proposed Action and Alternatives would provide substantial positive impacts to Natrona County and other affected local governments. Development of mineral resources in the project area would strengthen the economic base of Casper and Natrona County. Secondary economic effects would increase employment and income in the local service sector.

The BLM PRRA's standard operating procedures for raptor nesting restrictions are expected to limit access to only a very small portion of the project area under the Proposed Action and Alternatives B and C. The more stringent seasonal and year-round stipulations proposed for Alternative A would limit access to about one-third of the project area, or 8,373 of the total 25,093 acres. For up to six months each year and restrict access to 1,961 acres, or 8 percent, of the field-year-round. The criteria for Section 4.11.4 provides a clarification of the socioeconomic impacts which would likely result from the seasonal access restrictions under Alternative A. This clarification is fully disclosed potential adverse socioeconomic impacts associated with the more stringent seasonal and year-round restrictions under Alternative A. Similar socioeconomic impacts are not expected to result under the Proposed Action or Alternatives B and C, provided the proposed artificial nesting structures for raptor mitigation are implemented.

2.12 Transportation

The Proposed Action and Alternatives A and B would result in levels of truck traffic on US Highway 20/26 and Natrona County Road 104 (Arminto Road) higher than recent (1995 and 1996) levels when 11 and 10 wells were drilled, respectively.

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The increases in traffic associated with the Proposed Action and Alternatives A and B would create direct impacts from the construction of new roads and traffic associated with development and production activities. These impacts would occur steadily over the ten-year drilling program, although traffic impacts may be more concentrated during the periods when the seasonal restrictions are not in effect under Alternative A. Due to the low increases in traffic volumes associated with the Proposed Action and Alternatives A and B, and due to the existing condition and excess capacity on affected highways, these impacts are not considered significant.

The effects of the No Action Alternative on transportation cannot be estimated because the details of the proposals are not currently known.

2.13 Health and Safety

Potential health and safety hazards associated with the drilling program and associated construction activities could include improper sanitation, firearm accidents, criminal activities, occupational hazards, well blowouts, pipeline failure and exposure to hazardous materials. In most instances, however, exposure to these hazards would be limited to the project-related workforce. However, implementation of environmental protection and mitigation measures described in Chapters 2 and 4 would minimize the risk of exposure to these hazards. For example, sewage and solid-waste would be stored in closed containers and hauled off-site to a permitted disposal facility. Increased surveillance of the project area would minimize the risk of criminal activity and firearms-caused damage to production equipment. Safety and fire control measures already required and implemented at production and drilling sites would minimize the risk of wildfire. Some occupational hazards associated with oil and gas drilling are unavoidable but the risk of an accident would be reduced by the use of blowout preventers, protective clothing, safety equipment, and compliance with BLM and Federal safety regulations. Hydrogen sulfide has not been associated with exploration or production activities of this gas reservoir. Marking of pipeline routes and use of the latest pipe materials and coatings would help to reduce the potential for pipeline ruptures. Finally, the project has been designed to avoid the use of materials designated by Federal regulation as extremely hazardous. Waste minimization, implementing, implementing, and enforcing existing regulations, and compliance with Federal regulations governing the identification, signing, transportation, storage and disposal of hazardous materials would minimize the environmental risks associated with the use of these materials. Taken together, the project would not result in substantial health and safety risks to public health and safety, and tribal workers.

2.14 Noise

A temporary increase in ambient noise levels in the vicinity of drilling and construction activities would be unavoidable. Workers on drilling rigs and heavy equipment would be exposed to the highest noise levels which would require hearing protection under Federal regulations. Noise from drilling activities generally would recede below the EPA standard of 55 dBA in 0.1 mile or less. Regardless of the type of rig used, noise levels would recede to background level (35-40 dBA) within 0.75 miles. However, if diesel-electric rigs with mufflers were used, noise is expected to recede to background level within 0.4 miles of the well site. Given these conditions, the lack of residences, and the availability of zoning restrictions to protect wildlife-related noise sensitive areas, noise impacts caused by drilling would be minimal. Temporary "spikes" in noise levels associated with project traffic and construction equipment would be unavoidable, but given the dissipation of noise impacts with distance, and Federal regulations requiring noise control equipment on heavy trucks and construction equipment, this impact is not expected to exceed 55 dBA at noise sensitive locations such as residences. Infrquent "spikes" in noise levels due to the operation of blow-down
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Under the Proposed Action and Alternatives A and B, development of the liquids recovery plant would produce a locally-significant, adverse site-specific impact on visual resources. Otherwise, while the Proposed Action and Alternatives A and B would add to cumulative impacts, they would not produce an overall significant impact on visual qualities of the project area, these changes would not be significant because they would be consistent with a VRM Class 4 designation and the RMP. Potential cumulative impacts on visual resources caused by implementation of the No Action Alternative were unknown, as ongoing development and production activities would be considered on a case-by-case basis and it was possible that some activities could proceed outside of BLM jurisdiction if non-Federal lands and minerals were involved.

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stacks and relief valves would be unavoidable and necessary for safe field operations. Even with implementation of noise-control technologies, a long-term increase in ambient noise levels in the vicinity of field compressors and the liquids recovery plant would be unavoidable. It is estimated that noise levels from these types of facilities would approach the 65 dBA standard within 500 feet and therefore would be highly unlikely to adversely affect sensitive locations. Mitigation measures requiring the use of mufflers and other sound control measures at central compression facilities also would help to minimize the extent of this impact. No noise standards have been specified in affected leases and the project would be in compliance with RMP provisions related to noise.

3.0 SCOPE OF ANALYSIS

The purpose of the proposed process, as stipulated (40 CFR, Parts 1500-1508), is to identify important issues, concerns, and potential impacts that require analysis in the EIS and to eliminate insignificant and insubstantial alternatives from detailed analysis. Public participation, consultation, and coordination have occurred throughout the planning process for this EIS through Federal Register notices, press releases, scoping meetings, individual contacts, and informal consultation. Contact dates and actions taken by BLM are summarized in Chapter 6 - Public Participation, Consultation, and Coordination. All information received during the scoping process is available for review at the Casper District Office.

Also, during preparation of the FEIS, the BLM and consultant Interdisciplinary Team (IDT) have communicated with, and received input from various federal, state, county, and local agencies, elected representatives, environmental and citizen groups, industries, and individuals potentially concerned with issues regarding the proposed drilling action.

4.0 SUMMARY OF CUMULATIVE EFFECTS

Chapter 5 of the DEIS provides a detailed, resource-by-resource analysis of cumulative impacts in addition to a summary of impacts for each project alternative, including the No Action Alternative, and a comparison of the alternatives in terms of cumulative impacts has been provided as Table 5-8 of the DEIS. Assuming the implementation of environmental protection and mitigation measures described in Chapter 7, the cumulative impacts of Alternative A and B of the DEIS, no cumulative impacts in excess of threshold criteria would occur except in the case of recreation and visual resources.

Cumulative recreation impacts were found to be significant for the Proposed Action and Alternatives A and B because the project, in combination with past and reasonably foreseeable activities, would result in the complete displacement of non-motorized recreation activities from the project area. However, the actual size of this displacement and the adverse incremental impact caused by the project is low given the low rate of recreation use currently found in the area. Initially, the impacts associated with Alternative C would not be considered significant, but in the long-term the development could produce significant impacts. Importantly, the Proposed Action or project alternatives would not result in significant cumulative impacts to long-term resource recreation and tourism resources or destinations. The Proposed Action and project alternatives would be in compliance with recreation management provisions of the RMP.

Potential cumulative recreation impacts associated with implementation of the No Action Alternative would be unknown until alternative activities and locations were proposed.
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Impact of 800 acres. These estimates do not take into account the likelihood that a significant percentage of the proposed locations may not be drilled, may result in unsuccessful wells or wells uneconomical to produce. Such locations and associated access roads would be reclaimed and would not contribute to cumulative, long-term impacts. Under the No Action Alternative cumulative disturbance would be 452 acres plus any long-term disturbance associated with an unknown level of additional development allowed to proceed on a case-by-case basis.

Given the application of mitigation procedures described in the DEIS, it is likely that no significant long-term cumulative impacts to wildlife populations would result from the implementation of the Proposed Action or alternatives. Under the Proposed Action and Alternatives B and C, short-term impacts to the golden eagle pair using nests 2 and 20 are likely to occur because of the time required by this species to adapt to and utilize ANSs. Under the Proposed Action and Alternative B, effective placement of ANSs may increase raptor production over the long-term to higher levels than existed prior to development. Monitoring would be conducted as necessary to ensure the success of mitigation measures. The positive, cumulative impacts of implementing activities that increase raptor production would not occur under the No Action Alternative.

5.0 AGENCY-PREFERRED ALTERNATIVE

Based on comments received and considered during the public review period of the Draft EIS, and as allowed under CEQ regulation 1503.4 and BLM's NEPA Handbook, H-1795-1, Chapter V, Section B.4.c., the BLM has reappraised the Agency-Preferred Alternative presented in the DEIS in the Final EIS. BLM is selecting the Proposed Action as the Agency-Preferred Alternative. The change is based on additional information acquired during the DEIS public comment period, analysis provided in the DEIS, and public and BLM internal review comments.

Selection of the Proposed Action as the Agency-Preferred Alternative does not imply that this will be the BLM's final decision. Additional information acquired during the FEIS public comment period, and public and BLM internal review comments may result in the selection of an Agency Preferred Alternative in the Record of Decision (ROD) that combines components of the Proposed Action and Alternatives A and B to provide the best mix of operational requirements and mitigation measures needed to reduce environmental harm.

The Agency-Preferred Alternative identified in the DEIS was Alternative B. Under Alternative B, a proposed Key Raptor Area was intended that was intended to provide for secure long-term raptor nesting habitat adjacent to the project area and serve as a core or refuge area where long-term reproduction opportunity for raptors of multiple species would be ensured. The proposed Key Raptor Area was also intended to serve as a development area from which to populate or repopulate other areas in the Greater Cave Gulch Raptor Area Analysis Area (GRAA) where future disturbances may cause temporary depletions in raptor populations.

Analysis presented in the DEIS determined that, under the Proposed Action, the effective placement of artificial nesting structures (ANSs) throughout the GRAA would provide nesting opportunities for pairs of raptors displaced by activity in the project area, and mitigate adverse impacts to raptors and their habitat in the project area.

Based on new information and comments on the DEIS, consultation with the USFWS, and further analysis of the range of alternatives and actions presented in the DEIS, the BLM concluded that: (1) an adequate number of secure sites for the placement of ANSs are likely to be available, and (2) that the use of ANSs to mitigate the expected displacement of 4 to 7 raptor pairs from the project area would be adequate without the use of the proposed KRA. The USFWS' concurrence with the placement of ANSs outside of existing raptor territories and outside of, but proximal to, the designated GRAA, and the offer to the BLM by Chevron and Barrett to provide long-term secure ANS sites on portions of their leaseholds within the GRAA, greatly expanded the area over which the BLM could select ANS sites and substantially increased the likeli-hood that 14 suitable sites for ANSs are available.

The selection of the Proposed Action incorporates compliance with the Platte River Resource Area Resource Management Plan (RMP) and implementation of various mitigation measures. Such measures include the following: (1) proponent-committed project-wide measures for preconstruction planning and design and specific resources. (2) Master Surface Use Plan and Natural Gas Pipeline Construction Master Plan (Appendix A), Reclamation Guidelines (Appendix B), and a Hazardous Substances Management Plan (Appendix D), and (3) additional mitigation measures recommended in Chapter 4 (Mitigation Summary of each resource element). The BLM has concluded that these detail a complete listing of practicable measures to reduce environmental harm resulting from the development and management in the Cave Gulch-Bullfrog-Waltman project area. The BLM also feels that the analyses demonstrate that the Proposed Action would meet the requirements of Federal Regulation 43 CFR 3162(a), which directs the Operators to conduct... all operations in a manner which ensures the proper handling, measurement, disposition, and site security of leasehold production, which protects other natural resources and environmental quality; which protects life and property; and which results in maximum ultimate economic recovery of oil and gas with minimum waste and with minimum adverse effect on ultimate recovery of other mineral resources.
SECTION 2 - ADDENDUM AND ERRATA

2.1 INTRODUCTION

The following sections have been prepared in response to public and agency review comments on the DEIS. The Addendum Section, Section 2.2, expands upon the air quality analysis found in the DEIS. This expanded cumulative impact analysis is based upon the cumulative impacts from the standpoint of assessing the potential impacts from existing, reasonably foreseeable and proposed sources of emissions. The analysis addresses the construction and operation phases of oil and gas development, the details of which are available in a separate Technical Report entitled DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis. The Errata Section, Section 2.3, presents changes to the text of the DEIS organized by DEIS sections. Also, Figures 1-2, 1-3, 2-9, and 3-21 have been modified from the DEIS and are presented at the end of the Errata Section.

2.2 ADDENDUM

2.2.1 Air Quality

DEIS pages 5-3 through 5-6, Section 5.3 AIR QUALITY (CUMULATIVE IMPACTS ANALYSIS)

[NOTE: This addendum should be read in the context of Section 5.3 of the DEIS and is incorporated as Section 5.3 of the FEIS.]

5.3 AIR QUALITY

The assessment of air quality impacts has considered cumulative impacts from the standpoint of assessing the potential impacts from all existing, reasonably foreseeable and proposed sources of emissions. A very detailed "Cumulative Air Quality Impacts Analysis - Technical Support Document", and accompanying Addendum (Addendum provided in Appendix A), has been prepared that describes the analysis and is available upon request.

It was found that although some deterioration of air quality would occur (and would be unavoidable), potential impacts would not be significant. Long-term, cumulative air quality degradation would be due primarily to direct carbon monoxide and nitrogen dioxide emissions (and potential secondary ozone formation) from compression, dehydration, separation and storage tank operations. In brief, the analysis produced the following conclusions about cumulative impacts:

- Construction and operations would not cause an exceedance of National Ambient Air Quality Standards or Wyoming Ambient Air Quality Standards; and,
- Pollutant concentrations from individual sources required for oil and gas operations would not significantly "overlap" even where well spacing reached the maximum density. In other words, ground level concentrations of air pollutants would be localized around a well site such that installing additional wells in the field would not produce overlapping, cumulative concentrations of emissions.

The conservative, "worst case" emission assumptions used in the air quality analysis have defined an extreme, upper limit estimate of potential emissions. A review of current production activities
in the project area suggested that, in actual operations, this level of emissions and potential impact would not be reached or exceeded. For example, the worst case analysis assumed that all of the potential well sites would be producing—that is, there would be no dry holes when it is very unlikely that some wells would either dry or uneconomical to produce. The analysis assumed that all producing wells would be operational for 10 to 20 years. In reality, the productive life of a well could be much less and, in any case, production rates would not be constant over this period. Finally, the analysis assumed that all production activity would occur at the maximum possible emission rate and that this rate would be sustained continuously over the life of the field. In reality, emission rates would be variable. Equipment would seldom be operated continuously at a maximum capacity and emissions would vary under different production scenarios. Considering these assumptions, the analysis has produced an extreme, upper-bound estimate of potential air quality impacts that, in reality, would not be reached during implementation of the proposed activities.

Another factor mitigates against reaching this upper-bound estimate as well. Before emission sources could be constructed, the Wyoming Department of Environmental Quality (WDEQ) would require the project proponents to submit applications for air quality permits. These applications would address expected emissions from specific project components such as compressors. Additional site-specific air quality analysis and emission control measures could be required to ensure protection of air quality and compliance with applicable federal and state regulations. Considering this oversight, the possibility of reaching the “worst-case” emission scenario is reduced even further.

Nonetheless, due to public concerns about potential air quality impacts, an assessment of cumulative impacts was also performed to predict potential, cumulative air quality impacts at the Cloud Peak Class II Wilderness area to:

- calculate potential nitrate and sulfate deposition (and related water chemistry impacts) in sensitive lakes; and,
- to address potential changes in regional visibility

Three groups of sources were considered:

- emissions from the Proposed Action and Alternative well field development; and,
- sources with Wyoming Department of Environmental Quality permits, considered as “Permitted but not Operational”, including:
  - Colloid Environmental Technologies, Lowell Plant - Big Horn County
  - Texaco Gas, the Compressor Engine - Big Horn County
  - Texaco Oil Heaters - Big Horn County
  - Texaco Glycol Dehydrator - Big Horn County
  - WyoBen Sage Creek Bentonite Plant - Big Horn County
  - WyoBen Sluice Bentonite Plant - Big Horn County
  - AMOCO Big Sand Draw - Fremont County
  - Colorado Interstate Gas, Bridger Compressor Station - Fremont County
  - Holtz Construction Company - Johnson County

It is possible that these facilities may never become operational and add to cumulative impacts on air quality. However, in the interest of considering a “worst-case” scenario they were incorporated into this analysis.

- gas/oil wells that have been issued Wyoming Oil and Gas Conservation Commission permits since January 1996

Many of these wells may never become operational and add to cumulative impacts on air quality. However, in the interest of considering a “worst-case” scenario they were incorporated into this analysis.

It is important to consider the level of conservatism factored into this analysis when reviewing the modeling results. The projected impacts reflect “screening” level modeling—a modeling approach that is conservative by design. Therefore if the modeling shows impacts less than the significance criteria, there is no need to perform a more refined analysis. The following, conservative assumptions have been incorporated into the analysis of impacts on the Cloud Peak Class II Wilderness Area:

- All sources were assumed to be operating simultaneously and continuously at the highest rate of emissions possible. Given the number of sources included in this analysis (approximately 400), the probability of such an emissions scenario occurring over a 24-hour time period or an entire year is extremely small. While this assumption is typically used in such modeling analyses, the resulting impacts will be overstated. It should be noted that as the number of sources increases, the level of conservatism also increases.

- The Industrial Source Complex-Short-term (3rd generation) or ISCST3 model assumes instantaneous, straight-line transport of the plume. In other words, the model does not account for the actual travel time, distance, nor the non-linear path a plume would actually follow as it traveled from a source to the Cloud Peak Class II Wilderness Area. Due to this assumption, the model significantly overestimates the number of times a plume would actually reach the wilderness area. Also, because the model cannot predict the varying route, the concentration of an actual plume is overstated. This limitation is not very important for near-field assessments but for plume distances greater than 50 kilometers, the assumption becomes very conservative.

- The ISCST3 model also conservatively addresses plume transport for large elevation increases (3000 feet) in complex terrain. Even though a trajectory could transport the plume...
ADDENDUM AND ERRATA

Using these conservative assumptions, the maximum, predicted decievew reduction was 0.5. Under "real-world," field development conditions it is likely that the actual reduction in visibility would be significantly less. The ISLM considers a decievew change of 1.0 as potentially significant. This criteria was proposed by Pitchford and Malm (1994) and has been adopted by the Grand Canyon Visibility Transport Commission. A 1.0 decievew is defined as "about a 10 percent change in extinction coefficient, which is a small but perceptible scenic change under many circumstances." The USDA-Forest Service has established a 0.5 decievew as the "limit of acceptable change" to evaluate potentially significant visibility impacts at the Cloud Peak Class II Wilderness Area. But based on either criteria, the Proposed Action and project alternatives would not result in any perceptible visibility impact (even on the cleanest days) at the Cloud Peak Class II Wilderness Area

In summary, while an incremental increase in cumu'tive impacts to air quality would occur as a result of the Proposed Action or project alternatives, the magnitude of this increase would be small and, even under "worst-case" conditions, would not result in the exceedance of any federal or state air quality standard. Despite the incorporation of very conservative assumptions into the analysis, emissions from the Proposed Action and project alternatives would not result in cumulative impacts in excess of USDA-Forest Service criteria for allowable atmospheric deposition and changes in visibility at the Cloud Peak Class II Wilderness Area. The Wyoming Department of Environmental Quality has been granted the authority to monitor cumulative changes in air quality and to implement air pollution controls where necessary to ensure compliance with federal and state air quality standards.

Since emissions from the proposed activities would constitute many small sources spread out over a very large area, discrete visible plumes are not likely to be created or to impact the Cloud Peak Class II Wilderness Area. However, the potential for cumulative visibility impacts—such as increased regional haze and visibility degradation—is a concern. Regional haze is caused by fine particles and gasses scattering and absorbing light. Changes to regional haze are measured in terms of visibility differences relative to background (existing) conditions.

The Interagency Workgroup on Air Quality Modeling (IWAQM) has prepared a very conservative screening method to estimate potential regional haze impacts (IWAQM 1993). This method involves modeling SO2, NOx, and particulate emissions to estimate fine particle concentrations at the area of concern and to compute the potential visibility reduction which is defined in terms of "decievew" change. The magnitude of decievew change, its frequency, time of the year and meteorological conditions during times when decievew thresholds are above 1.0, as well as the inherent conservatism of the analyses, must be considered when assessing the significance of potential visibility impacts.

The ISCO T3 model was used to estimate the maximum 24-hour and annual average pollutant impacts created by the proposed development at receptors along the boundary of the Cloud Peak Class II Wilderness Area. For this analysis, NOx is the only pollutant of concern since sulfur emissions are unlikely during production of the "sweet" gas found in the field.

Background visibility was assumed to be 374 km (Standard Visual Range or SVR) based on data provided by the USDA-Forest Service monitoring program (Blett 1996). This represents a 96th percentile, best-case visibility for every day in a year. This is a very conservative assumption as the theoretical maximum, possible visibility is 391 km SVR. Conservative assumptions also were made about plume transport time, the occurrence of a 95 percent relative humidity, and the conversion efficiency of NOx to ammonium nitrate. Finally, the conservative nature of the analysis was taken one step further by including nearby sources which are "Permitted but not Operational." This meant that background visibility was assumed to be more clear than it otherwise might be if those already permitted sources were operating.

ADDENDUM AND ERRATA

Page 2-4 Cave Gulch-Bullfrog-Watman Natural Gas Development Project Final EIS - June 1997

Page 2-5 Cave Gulch-Bullfrog-Watman Natural Gas Development Project Final EIS - June 1997
ADDENDUM AND ERRATA

2.3 ERRATA

This section describes changes to the DEIS prepared in response to public comments. In some cases responses to public comment have been repeated here and incorporated into the FEIS. Where BLM response to a public comment referred the reader to the “errata,” this change has been indicated below. Additional changes have been made in the DEIS by the BLM to correct minor errors in the text.

EXECUTIVE SUMMARY

INTRODUCTION

Page S-2. Paragraph 1, line 7 has been changed to “The WRMG’s preliminary report relied upon by the BLM.”

AGENCY-PREFERRED ALTERNATIVE

Page S-5. Paragraph 2, lines 4 and 6, correct the two references of “GRRA” to “GRAA.”

LIST OF ACRONYMS/ABBREVIATIONS


Page A-II. Add “PM10 Particulate Matter - up to 10 microns in effective diameter.”

Page A-II. Revise as follows:

TSP Total Suspended Particulate Matter - up to 150 microns in effective diameter

VOC Volatile Organic Compounds (ozone precursors)

CHAPTER 1

PURPOSE AND NEED

1.1 PROJECT DESCRIPTION AND LOCATION

1.1.2 Location

Page 1-1. Add the following to the last sentence of this section as shown on Figure 1-2:

1.1.3.2 Cave Gulch Unit

Page 1-6. Replace the last two paragraphs, in their entirety, with the following:

In the absence of a special order by the WOGCC establishing or authorizing a different well density, the spacing pattern established by the WOGCC Rule 302 for unspaced areas applies. Rule 302 authorizes a well density of one well per 40 acres (16 wells per section).

Drilling activity within the Cave Gulch and Bullfrog Units is not regulated by a WOGCC spacing order. WOGCC Rule 302 has been vacated or suspended. By vacating Rule 302, Chevron and Barrett may develop Lance and Fort Union wells on any spacing pattern that would result in maximum efficient recovery of the natural gas reserves. In Areas 1 and 2 of the proposed action, wells would be developed on 1 well per 160 acres with a buffer zone where wells would be developed on 1 well per 80 acres. In Areas 3 and 4 of the proposed action, wells would be developed on 1 well per 40 acres exclusive of Sections 30, 31 and 32. Wells in Sections 30, 31, and 32 would be developed on 1 well per 20 acres with a buffer zone where wells would be developed on 1 well per 40 acres.

1.1.4 Land Status

Page 1-7. Paragraph 1, sentence 2 is corrected as follows: “Of this total, approximately 7,375 acres are federal, 1,244 acres are State of Wyoming, and 16,474 acres are private lands.”

Page 1-7. Tables 1-5 and 1-6 are corrected as follows:

Table 1-5. Surface Ownership of the Cave Gulch-Bullfrog-Waltman Project Area.

<table>
<thead>
<tr>
<th>SURFACE OWNERSHIP</th>
<th>ACRES</th>
<th>PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>16,474</td>
<td>65.7</td>
</tr>
<tr>
<td>Federal (BLM)</td>
<td>7,375</td>
<td>29.4</td>
</tr>
<tr>
<td>State of Wyoming</td>
<td>1,244</td>
<td>4.9</td>
</tr>
<tr>
<td>TOTAL</td>
<td>25,093</td>
<td>100.0</td>
</tr>
</tbody>
</table>
### ADDENDUM AND ERRATA

#### Table 1-6. Mineral Ownership of the Cave Gulch-Bullfrog-Waltman Project Area.

<table>
<thead>
<tr>
<th>MINERAL OWNERSHIP</th>
<th>ACRES</th>
<th>PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private</td>
<td>5105</td>
<td>20.3</td>
</tr>
<tr>
<td>Federal (BLM)</td>
<td>19182</td>
<td>76.5</td>
</tr>
<tr>
<td>State of Wyoming</td>
<td>806</td>
<td>3.2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>25093</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Page 1-8. Figure 1-3. Land status errors have been corrected; see corrected figure at end of the Errata section.

1.4 ENVIRONMENTAL ANALYSIS PROCESS

Page 1-10. Paragraph 1, replace the second sentence with the following: "The analysis is to disclose what impacts to the human environment would result from approval of the action and disclose the information used in determining those impacts."

1.5 RELATIONSHIPS TO POLICIES, PLANS, AND PROGRAMS

1.5.1.1 Platte River Resource Area Management Plan EIS and Record of Decision

Page 1-12. Last paragraph: remove the last sentence from Surface Disturbance Stipulations and place at the end of the 8th paragraph: No. 2 of Energy and Minerals (M1).

Page 1-13. Wildlife Stipulation. 1st bullet. Modify first sentence to read: "To protect important raptor nesting habitat..." 2ND. Add 2nd bullet: "Controlled Surface Use restriction within 1/2-mile radius of each active sage grouse lek."

Page 1-13. Wildlife Stipulation. Add the following as 2nd bullet: "The following land use plan decision for raptor nesting is applied specifically when raptor nests have been identified:

Where surface development proposals threaten the active nests of high federal or state interest raptor species, the PRRA will designate a suitable biologic buffer zone around the nest or nests where no surface development is permitted during the nesting season. Species identified jointly by the BLM the U.S. Fish and Wildlife Service, and the Wyoming Game and Fish Department as high interest species are bald eagle, golden eagle, osprey, peregrine falcon, prairie falcon, merlin, ferruginous hawk, Cooper's hawk, Swanson's hawk, burrowing owl, barn owl, great-horned owl, short-eared owl, long-eared owl, eastern screech-owl, northern saw-whet owl, northern goshawk, sharp-shinned hawk, northern harrier, and red-tailed hawk. An active nest is defined as one that has been used at least once during the previous three years.

Page 1-18. Table 1-7, under Natrona County, sentence 4 is modified as follows: "...new structures and non-mineral mining activity (aggregate material) where appropriate."

1.5.1.3 Development of Federal Oil and Gas Leases in the Cooper Reservoir Unit - Environmental Assessment - Number WY-062-06-047

Page 1-15. Paragraph 3, sentence 3 is modified to read: "...2 wells were proposed by Intoil, Inc. on private minerals."
2.1 ALTERNATIVE SELECTION PROCESS

2.1.1 Proposed Action

Page 2-9. Paragraph 2, sentence 1, quoted material is modified as follows: ‘require that all operations be conducted in a manner which protects other natural resources and the environmental quality, protects life and property and results in the maximum ultimate recovery of oil and gas with minimum waste and with minimum adverse effect on the ultimate recovery of other mineral resources.’

2.2 PROPOSED ACTION

2.2.2.1 Access Road Construction

Page 2-25. First paragraph, sentence 1 is modified as follows: ‘...in Figures 1-1 and 1-2.’

Page 2-11. Last paragraph, sentence 2 is modified as follows: ‘...activities associated with drilling 16 wells (160 wells during the 10-year drilling program = 16 wells per year).’

2.2.2.3 Drilling Operations

Page 2-18. Paragraph 2, sentence 1 is modified to read: ‘...water produced by Chevron’s wells during production operations is collected in a lined pit and then injected...’

2.2.2.4 Pipeline Construction

Page 2-20. Paragraph 1, sentence 2 is modified to read: ‘...installation procedures along side roads...’

2.2.2.6.2 Production Operations

Page 2-22. Paragraph 3, last sentence, ‘... Waitman Unit’ is corrected to read ‘... Bullfrog Unit’.

Page 2-25. Figure 2-9 has been modified to include a second dehydrator and a second separator; see corrected figure at end of the Errata section.

Page 2-26. Figure 2-10. Two references to ‘... Waitman Unit’ are corrected to ‘... Bullfrog Unit’.

2.2.2.12 Project-Wide Mitigation Measures

Page 2-30. Resource-Specific Mitigation. Air Quality. Paragraph 2, replace entire second paragraph as follows: ‘The operators will institute immediate abatement of fugitive dust (by application of water, chemical dust suppressants, or other measures) when an air quality, soil loss, or safety concerns are identified by the BLM or the WDEQ/AQD. These concerns include, but are not limited to, potential exceedances of applicable air quality standards. The BLM will approve the

control measure, location, and application rates. If watering is the approved control measure, the operator must obtain the water from State-approved source(s).’

2.3 ALTERNATIVE A

Page 2-36. Paragraph 3, line 4 has been modified to read: ‘...seasonal 1-mile buffer zone for all selected ferruginous hawk nests (Figure 2-12)’ and thereby is in agreement with the information presented in Figure 2-12 in the DEIS.

Page 2-38. Last paragraph, line 2, add two paragraphs following the first sentence:

‘The number of wells identified under Alternative A includes the deep test wells. The deep test wells could be located within any of the spacing areas. Under Alternative A, individual or twin well pads would be designed or enlarged to accommodate centralized production facilities. The average area that would be used for individual or twin production facilities (shown on DEIS figures 2-7 and 2-9) is approximately 2.75 acres. The area that would be needed for facilities for centralized production is an additional disturbed area of approximately 0.625 acre per centralized facility (areas would range from 0.5 acre to 0.75 acre, for an average of 0.625 acre).

If 28 centralized production facilities were implemented, up to 17.5 acres in addition to the area disturbed by well pads would be required (28 X 0.625 = 17.5). Two centralized compression stations under Alternative A are estimated to require up to 3 acres each, for a total of 6.0 acres of disturbance. The total estimated disturbance that would result from centralized production facilities and centralized compression stations is 23.5 acres (17.5 + 6.0 = 23.5). This is included within the 35 acres analyzed for ancillary facilities.’

2.4 ALTERNATIVE B (BLM PREFERRED ALTERNATIVE)

Page 2-40. Paragraph 1 (bold text). Sentence 2 is deleted.

Page 2-40. Paragraph 3, last sentence, add the following text at the end of the sentence: ‘...for projects in the proposed KRA.’

Page 2-43. Paragraph 5, line 2. After the first sentence, add the following sentence: ‘The number of wells identified under Alternative B includes the deep test wells. The deep test wells could be located within any of the spacing areas.’

2.5 ALTERNATIVE C - NO ACTION

Page 2-43. Paragraph 1, sentence 1 is modified to read: ‘The CEQ regulations...’ (40 CFR 1502.14 (d)).
ADDENDUM AND ERRATA

2.6 ALTERNATIVES CONSIDERED BUT NOT ANALYZED IN DETAIL

Page 2-46. Add new paragraph to second bullet:

"The location of a liquid processing plant is greatly restricted by physical and engineering constraints. Some technical constraints include the need to connect the plant to transportation pipeline systems; the need for all weather access for operational purposes; and, close proximity to producing wells due to gas and pipeline pressures and associated compression. Information submitted for the plant includes information about alternative sites that were considered, including locations on private and/or state owned surface. However, the BLM does not have the authority to require a facility to be located on nonfederal surface. Therefore, in consideration of these limitations, a detailed analysis of alternative locations other than the site proposed by the Operators was not conducted."

ADDENDUM AND ERRATA

CHAPTER 3
AFFECTED ENVIRONMENT

3.1 GEOLOGY/PALEONTOLOGY

3.1.1.2 Mineral Resources

Page 3-6. Paragraph 5, line 7 is modified to read "...containing 0.04 percent UO₃ (Uranium oxide), from the Bridger Trail prospect (T37N, R88W), developed in this zone (Harris and King 1993)."

3.1.1.3 Geologic Hazards

3-9. Paragraph 1, line 7, two references to "Cave Creek" are corrected to read "Cave Gulch".

3.1.2.1 Regional Paleontologic Overview

Page 3-10. Last paragraph, last line, reference to "Cave Creek" is corrected to read "Cave Gulch".

3.2 AIR QUALITY

3.2.1 Climate, Precipitation, and Winds

Page 3-13. Figure 3-2, add: "Source: (EPA 1996)"

Page 3-13. Figure 3-2. Revise as follows: "WIND SPEED CLASSES (knots)"


Page 3-14. Add the following after the second paragraph:

"Potential severe weather conditions and frequency of occurrence may be summarized as follows (Rykaczewski et al. 1990). From 1916 through 1987, the Wyoming State Climatologist has reported fifteen tornadoes in the Casper District. Statewide (based on the same time period), 165 tornadoes were reported, with 45 percent occurring in June, 42 percent in May and July, and twelve percent occurring during the other nine months.

The majority of thunderstorms occur between April and September, with most occurring in June and July. The Casper District averages 40 to 50 days with thunderstorms annually. Large hail, strong winds, and occasional tornadoes are associated with severe thunderstorms. The Casper District averages between two and four days with hail each year.

Lightning is commonly associated with summer thunderstorms, although damage and occurrence data are not often reported. Strong, sustained winds occur quite often, and observations indicate winds of 70 to 80 miles per hour (with gust to 100 miles per hour) can occur throughout Wyoming."
ADDENDUM AND ERRATA

Section 3.2.2 Air Quality

Page 3-14. First paragraph, end of last sentence, add "(WDEQ 1995) and (WESTAR 1995)."

Page 3-14. Third paragraph, end of first sentence, add "(WDEQ 1996)."


Page 3-15. Replace Table 3-4 with the following:

Table 3-4. Background Air Quality Concentrations, Applicable Standards and PSD Increments (micrograms per cubic meter - μg/m³)

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Class</th>
<th>Averaging Time [a]</th>
<th>Background Concentration</th>
<th>WAAQS</th>
<th>NAAGS</th>
<th>PSD Increments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO</td>
<td>Class 1</td>
<td>1-hour</td>
<td>3.500</td>
<td>40,000</td>
<td>40,000</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8-hour</td>
<td>1.500</td>
<td>10,000</td>
<td>10,000</td>
<td>none</td>
</tr>
<tr>
<td>NO₂</td>
<td>Annual</td>
<td></td>
<td>2</td>
<td>100</td>
<td>100</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ozone</td>
<td>1-hour</td>
<td></td>
<td>110</td>
<td>150</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SO₂</td>
<td>3-hour</td>
<td></td>
<td>93</td>
<td>1,300</td>
<td>1,300</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>24-hour</td>
<td></td>
<td>32</td>
<td>260</td>
<td>365</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>Annual</td>
<td></td>
<td>4</td>
<td>60</td>
<td>80</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSP</td>
<td>24-hour</td>
<td></td>
<td>70</td>
<td>150</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>Annual</td>
<td></td>
<td>42</td>
<td>150</td>
<td>150</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>50</td>
<td>50</td>
<td>4</td>
</tr>
<tr>
<td>PM10</td>
<td>24-hour</td>
<td></td>
<td>19</td>
<td>50</td>
<td>50</td>
<td>4</td>
</tr>
</tbody>
</table>

Note: [a] Short-term concentrations reflect the maximum measured values during the entire period of record (i.e., NO₂, 1996 through 1987; TSP and PM10 annual 1995; etc.), except for ozone, which reflects the 90th percentile maximum 1-hour value measured at Pinedale, Wyoming, during 1993 through 1994.

3.3 SOILS

3.3.2 Soil Map Unit Descriptions

Page 3-21. Table 3-5. Page 3 of the table is corrected to include Soil Map Unit #229 and the following: Map unit name: Orpha loamy sand (15% inclinations. Tullock loamy sand and Vonaek loamy sand); Slope phase: 10 to 30 percent; Topography: stable dunes, 5,300 - 6,400 ft.; Series: Orpha loamy sand (85%); Parent material: eolian deposits; Depth: very deep; Predominant texture: loamy sand; Drainage: excessively drained; Permeability: very rapid; and Effective rooting depth: >60 in.

3.4 WATER RESOURCES

Page 3-32. Following paragraph 1, add new paragraph 2 as follows: "To date, water for drilling operations has been obtained from either Mel's Water Service, or the Flying A Ranch. The Mel's..."
ADDITION AND ERRATA

3.7.2.3 Raptors
Page 3-59. Paragraph 1, line 5 is corrected as follows: "... the operators recommended an increase in the size and extent of the raptor monitoring and inventory area."

Page 3-59. Paragraph 1, line 7 is modified as follows: "This expanded raptor analysis area, hereinafter referred to as the Greater Raptor Analysis Area (GRAA), is..."

Page 3-65. Paragraph 1, lines 2 and 5, references are corrected to read: "(HWA 1996)."

3.7.3 Special Status Wildlife Species
Page 3-68. Paragraph 2, sentence 1 is modified as follows: "... two species designated as Candidate wildlife species."

Page 3-68. Table 3-20. The two references to 'C' Status have been corrected to "Candidate" Status.

Page 3-69. Add the following at the end of Section 3.7.3: "Aquatic Animals. No known endangered, threatened, candidate or sensitive species of aquatic animals are known to be or suspected to be associated with the wetland sites on the project area."

3.9 VISUAL RESOURCES
Page 3-70. Paragraph 1. Replace sentence 6 with the following clarification: "An estimated 4,000 acres within the analysis area have been classified as having Class A or B Scenic Quality. Between 700 and 1,000 acres have been impacted by oil and gas development when viewed from existing transportation roads within the analysis area. The remaining 3,000 to 3,300 acres will retain Class A or B Scenic quality."

Page 3-73. Paragraph 4. Remove sentence 6 in its entirety, which reads: "Equally sensitive... into the project area."

3.10 CULTURAL RESOURCES
3.10.1 Cultural Resource Data Base
Page 3-75. After the first paragraph add the following paragraph:

"None of the cultural resources discovered in the core area are of the type, density or distribution to suggest that there is any potential for the presence of Native American sacred sites or Traditional Cultural Properties. Instead, the known site inventory consists of routine domestic and utilitarian debris which lies well below the threshold of materials that would invoke evaluation as potential Traditional Cultural Properties. The spatial distribution of known sites suggests a fairly high density at the base of the rugged uplifted sandstone strata, which is a sheltered area at the ecotone between the lower open rolling terrain to the east and the upper flatter area to the west. Ecotone areas like this are optimal for seasonal occupation but do not represent a high sensitivity as sacred sites. The open areas surrounding the highland/lowlanbd ecotone have a much sparser distribution of prehistoric sites; these tend to be smaller open lithic scatters and small camp sites. Again, these are not the site types that tend to be associated with sacred site situations."

3.11 SOCIOECONOMICS

3.11.3.1 Employment, Unemployment, and Labor Force
Page 3-77. First paragraph. sentence 3 is corrected as follows: "Between the peak of 1981 and the trough of 1987, total Natrona County employment fell from 51,150 jobs to 36,403 jobs, a loss of 29 percent over the 8 year period."

3.11.3.2 Other Economic Sectors
Page 3-80. First paragraph is corrected as follows: "... Manufacturing employment crew from 1,880 in 1973 to 2,154 in 1981, an increase of 15 percent. From the peak, manufacturing employment declined to a low of 1,391 in 1983, a 35 percent loss, and has rebounded to 1,788 in 1994, a 28.5 percent increase over the low point."

Page 3-81. First paragraph is corrected as follows: "In contrast Natrona County service sector employment has shown annual increases in all but three years during the 1973 through 1994 period ending at 11,017 for a 10.5 percent increase over the 1973 level of 5,255."

3.11.3.4 Earnings
Page 3-84. First paragraph is corrected as follows: "... Between 1990 and 1994 per capita personal income increased 17.1 percent."

3.11.7.1 Natrona County
Page 3-87. First paragraph is corrected as follows: "Law enforcement and criminal justice systems (along with county roads which are discussed in Section 3.12)."

3.11.9 County Fiscal Conditions and Mineral Tax Revenues
Page 3-92. Figures in the last row of Table 3-31 (General Fund Mill Levy) are in mills rather than percentages.

3.12 TRANSPORTATION

3.12.3 Existing Transportation System and Conditions within the Project Area
Page 3-94. Figure 3-21. The road classifications shown on the figure have been modified to reflect the correct status of the project area road network. See corrected figure at the end of the Errata section.
ADDENDUM AND ERRATA

3.14 NOISE


Page 3-100 Table 3-34. footnote one, second sentence, replace with: "Source: USDI-BLM (1990), as based on Federal Energy Regulatory Commission (no date)."

Page 3-100 Table 3-34. footnote two, replace with: "Actual noise level field data reported in Kruger (1981)."

Page 3-100 Table 3-34. footnote four, third sentence, replace with: "There can be times when the noise is higher or lower than this dBA level."

Page 3-100 Table 3-34. footnote five, replace with: "Actual noise level field data reported in Kruger (1981)."

Page 3-100 Table 3-35. footnote one, replace with: "Source: USDI-BLM (1990). as based on Federal Energy Regulatory Commission (no date)."

Page 3-100 Table 3-35. footnote two, replace with: "Actual noise level field data reported in Kruger (1981)."

Page 3-100 Table 3-35. footnote four, third sentence, replace with: "There can be times when the noise is higher or lower than this dBA level."

Page 3-100 Table 3-35. footnote five, replace with: "dBA = average sound level in decibels (audible frequency range)."

ADDENDUM AND ERRATA

CHAPTER 4

ANALYSIS OF ENVIRONMENTAL CONSEQUENCES

4.1 GEOLOGY/MINERALS/PALEONTOLOGY

4.1.5.3 Paleontology

Page 4-6. Specific Mitigation Measures. Paragraph 1, sentence 2 is corrected as follows: "A paleontologic report documenting the survey is provided in Appendix E."

4.2 AIR QUALITY

Section 4.2.1 Introduction

Page 4-7. Paragraph 1, sentence 5, is modified as follows: "Individual well sites could be permitted following a limited start-up period, as required by the WDEQ/AQD."

Section 4.2.2 Impact Significance Criteria

Page 4-7. Paragraph 1, last line is modified to read: "...allowed in specific areas, shown in Table 3-4."

Section 4.2.3.1 Proposed Action, Alternatives A, B, and C

Page 4-8. Paragraph 1, last sentence, replace "VOC (Ozone)," with "VOC (Volatile Organic Compounds - ozone precursors)."

Page 4-8. Paragraph 5. Replace entire paragraph as follows: "The air quality impact analysis assumed water and/or chemical dust suppressants would be applied in order to achieve a 50 percent control efficiency to minimize TSP and PM10 fugitive dust emissions."

Page 4-9. Replace first paragraph as follows: "The maximum direct CO impacts predicted to occur from the compressor engines during the maximum well field production phase are nearly 1,020 \( \mu \text{g/m}^3 \) (1-hour) and 727 \( \mu \text{g/m}^3 \) (8-hour). When these values are added to the assumed background concentrations, total maximum CO impacts become nearly 4,520 \( \mu \text{g/m}^3 \) (1-hour) and 2,227 \( \mu \text{g/m}^3 \) (8-hour), demonstrating compliance with the applicable CO standards of 40,000 \( \mu \text{g/m}^3 \) (1-hour) and 10,000 \( \mu \text{g/m}^3 \) (8-hour)."

Page 4-9. Third paragraph, end of second sentence, add "(Dailey 1996)."

Page 4-9. Paragraph 4, first sentence is modified as follows: "Possible NOx emission control measures include:"

Page 4-10. Paragraph 1, first sentence is modified to read: "At the predicted ratio (2:2)."

Page 4-10. Add new second paragraph: "Potential emission levels would meet Prevention of Significant Deterioration (PSD) Class II increment limits (no PSD Class I areas are likely to be affected by the proposed project). The maximum modeled NOx concentration of 22.3 is below the..."
applicable PSD Class II increment of 25 μg/m³. This comparison is not a comprehensive PSD Increment Consumption analysis (which is a regulatory inventory and compliance responsibility of the state regulatory agencies and the EPA), but is included to indicate the potential level of significance.

Page 4-10. Paragraph 3. replace the fifth through seventh sentences as follows: "In addition, there would be no further cumulative risk, since no residence would be affected by more than a group of eight wells and one compressor at the same time. Under the MLE scenario, the estimated cancer risks associated with long-term exposure to benzene and formaldehyde concentrations are 7e-08 and 4e-07, which are both below the 1e-06 threshold. The estimated total MLE cancer risk for the inhalation pathway (5e-07) is also less than 1e-06."

Page 4-10. Table 4-1. Add "Source: (EPA 1997)"

Section 4.2.4 Impacts Summary

Page 4-11. Paragraphs 2 and 3 have been replaced with the following: "Potential cumulative air quality impacts at the Cloud Peak PSD Class II Wilderness Area are described in Section 5.3 (Cumulative Impacts Analysis - Air Quality). See Addendum: Air Quality above."

4.3 SOILS

4.3.2 Impact Significance Criteria

Page 4-12. Paragraph 2 (second bullet), add the following: "Should a watershed management plan be required for the Cave Gulch watershed, the BLM would coordinate with WDEQ and other appropriate federal, state, and local agencies."

Page 4-12. Paragraph 3 (third bullet) is deleted from the text.

4.3.3.1 Proposed Action

Page 4-18. Paragraph 3, line 17: disturbance of "394.07 acres" is corrected to "394.01 acres".

4.3.3.2 Alternative A

Page 4-21. Paragraph 2, line 2: disturbance of "733.39 acres" is corrected to "670.01 acres".

Page 4-23. Table 4-10. Well pad acres total is corrected from "160.09" to "160.10".

4.3.3.3 Alternative B

Page 4-26. Paragraph 1, line 3. "Alternative A" is corrected to read "Alternative B".

Page 4-27. Table 4-14. Well pad acres total is corrected from "185.51" to "185.50".

4.3.5 Mitigation Summary

Page 4-29. First bullet is modified as follows. "Reduce all soil disturbance...for safe construction and operation."

Page 4-29. Second bullet, line 2 is modified to read: "...areas with poor and very poor reclamation potential..."

Page 4-30. Paragraph 3 (third bullet) delete second sentence from the text.

4.4 WATER RESOURCES

4.4.1 Introduction

Page 4-31. Paragraph 1, last sentence is modified as follows: "...protection. EO 11988 (floodplain protection), EO 11990 (wetlands protection), and the Federal..."

4.4.2 Impact Significance Criteria

Page 4-31. Second main bullet is modified as follows: "Compliance with Executive Orders 11988 (protection of floodplains) and 11990 (protection of wetlands)."

4.4.3.1 Proposed Action

Page 4-34. Paragraph 2, line 9 is modified as follows: "Therefore, total water demand including hydrostatic testing."

Page 4-34. Paragraph 2, line 3 is modified as follows: "...in compliance with EPA standards on hazardous substances."

Page 4-36. Paragraph 1. Add the following text: "Due to unconsolidated bedding at shallow depths, the surface casing is typically set to a depth of 500 feet in the majority of the wells drilled in this field. For depths greater than 500 feet, the operators run well logs on potential oil and gas wells to determine formation characteristics and hole integrity. These logs can also be used to determine the presence of usable water and other water sources. The logs for wells drilled in the project area can be located at the WOGCC or the BLM's Casper District Office, WRMG."

Page 4-36. Paragraph 4, sentences 3 and 4 are modified as follows. "Water is produced from existing Barrett and Chevron wells within the Cave Gulch and Waltman field areas. Such water is either injected into the Chevron Waltman No. 15 well or disposed into the Barrett Bullfrog 1-6 lined evaporation pit without adverse effects."

4.4.3.2 Alternative A

Page 4-37. Paragraph 1, line 9 is corrected to read: "...as summarized in Table 4-7."
ADDENDUM AND ERRATA

4.4.3.3 Alternative B
Page 4-39, Paragraph 1, line 1 is corrected to read: "Table 4-3 summarized the total disturbance under Alternative A according to slope class."

4.5 VEGETATION AND WETLANDS

4.5.3.3 Alternative B
Page 4-47, Paragraph 1, line 4 is corrected to read: "...as itemized in Table 4-17."

4.6 RANGE RESOURCES AND OTHER LAND USES
Add the following section to page 4-52:

"4.6.3.4 Alternative C
Alternative C would result in ongoing site disturbance with an associated loss of forage production. The amount of forage production lost is unquantifiable since the anticipated level of development is not known."

4.7 WILDLIFE

4.7.2 Impact Significance Criteria
Page 4-53, First bullet, sentence 1 is modified to read: "...management objectives and laws for wildlife."

4.7.3.1 Proposed Action
Page 4-54, Paragraph 2, line 4 is modified to read: "...as the third sentence: "Similarly, open tanks containing oil or other adverse substances will be netted or otherwise secured to protect migratory birds."

4.7.3.1.3 Upland Game Birds
Pages 4-56 and 4-57, Sage Grouse, Paragraph 2 is modified by deleting sentences 1 and 2, and replacing them with: "The results of sage grouse surveys conducted during the spring of 1997, and 3 years of ground work in the project area, revealed that crucial sage grouse habitats do not occur on or within two miles of the project area. Therefore, impacts are not expected."

4.7.3.1.4 Raptors
Page 4-57, Paragraph 1, line 3 is modified by replacing "...during formal surveys in the spring..." with "...the future..."

4.7.3.2.4 Raptors, Alternative A
Page 4-57, Paragraph 2, line 2 is modified to read: "...a total of 17 nests were..." Line 9 is modified to read: "The identification numbers of nests which were tended or active during 1995 and 1996 include: ferruginous hawk - 3&4, 15, 25&26, 32&34, 41, and 72..."

Page 4-57, Paragraph 3, line 1 is modified to read: "...zone of influence of active raptor nests..."

4.7.3.3.4 Raptors, Alternative C
Page 4-59, Buffer Zones, Paragraph 1, line 1 is modified to read: "Under the Proposed Action, all active nests in the project area..." and line 8 is corrected to read: "...for other raptor species from March 15 through July 31."

4.7.3.3.4 Raptors, Alternative B
Page 4-60, Artificial Nesting Structures, Paragraph 1, lines 8 and 9 are modified as follows: "within the project area and the Greater Raptor Analysis Area (GRAA) within which the project area occurs..."

Page 4-60, Artificial Nesting Structures, Add the following text, as last paragraph at the end of the section: "Artificial raptor nest structures are not expected to create visual impacts because they will be: (1) placed in remote areas away from and out of view of roads in areas not frequented by people, (2) constructed entirely of unpainted or stained wooden materials that will weather and blend with the surrounding landscape, and (3) are relatively insignificant visually (12 feet high) when integrated into the large scale landscape and topography of the GRAA."

Page 4-61, Use of ANS for moving raptors from certain problem areas, Paragraph 1, last sentences is modified to read: "Apple (1994) and Call (1989 and 1994) have reported the success of this approach in other areas in Wyoming."

Page 4-62, Other Impacts, Paragraph 2, last sentence is modified as follows: "...The State of the Art in 1996 (APIC 1996)."

4.7.3.2.4 Raptors, Alternative A
Page 4-64, Paragraph 1, line 15 has been modified to read: "...1-mile buffer zone for all selected ferruginous hawk nests."

4.7.3.3.4 Raptors, Alternative B
Page 4-67, Paragraph 4, line 13 has been modified to read: "...and increased competition among birds in the surrounding area, including those in the proposed RRA..."

4.7.4.1 Big Game, Upland Game Birds, Special Status and General Wildlife
Page 4-69, Paragraph 2, line 4, replace reference to "Section 2.2.4.1" with "Section 2.2.2.12."

Page 4-70, First bullet, line 4, insert the following as the third sentence: "Similarly, open tanks containing oil or other adverse substances will be netted or otherwise secured to protect migratory birds."

Page 4-70, First bullet, line 4, insert the following as the third sentence: "Similarly, open tanks containing oil or other adverse substances will be netted or otherwise secured to protect migratory birds."

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Page 4-57. Paragraph 1, line 3 is modified by replacing "...during formal surveys in the spring..." with "...the future..."

4.7.3.1.4 Raptors
Page 4-57. Paragraph 2, line 2 is modified to read: "...a total of 17 nests were..." Line 9 is modified to read: "The identification numbers of nests which were tended or active during 1995 and 1996 include: ferruginous hawk - 3&4, 15, 25&26, 32&34, 41, and 72..."

Page 4-57. Paragraph 3, line 1 is modified to read: "...zone of influence of active raptor nests..."

Page 4-59. Buffer Zones, Paragraph 1, line 1 is modified to read: "Under the Proposed Action, all active nests in the project area..." and line 8 is corrected to read: "...for other raptor species from March 15 through July 31."

Page 4-60. Artificial Nesting Structures, Paragraph 1, lines 8 and 9 are modified as follows: "within the project area and the Greater Raptor Analysis Area (GRAA) within which the project area occurs..."

Page 4-60. Artificial Nesting Structures, Add the following text, as last paragraph at the end of the section: "Artificial raptor nest structures are not expected to create visual impacts because they will be: (1) placed in remote areas away from and out of view of roads in areas not frequented by people, (2) constructed entirely of unpainted or stained wooden materials that will weather and blend with the surrounding landscape, and (3) are relatively insignificant visually (12 feet high) when integrated into the large scale landscape and topography of the GRAA."

Page 4-61. Use of ANS for moving raptors from certain problem areas, Paragraph 1, last sentences is modified to read: "Apple (1994) and Call (1989 and 1994) have reported the success of this approach in other areas in Wyoming."

Page 4-62. Other Impacts, Paragraph 2, last sentence is modified as follows: "...The State of the Art in 1996 (APIC 1996)."

4.7.3.2.4 Raptors, Alternative A
Page 4-64, Paragraph 1, line 15 has been modified to read: "...1-mile buffer zone for all selected ferruginous hawk nests."

4.7.3.3.4 Raptors, Alternative B
Page 4-67, Paragraph 4, line 13 has been modified to read: "...and increased competition among birds in the surrounding area, including those in the proposed RRA..."

4.7.4.1 Big Game, Upland Game Birds, Special Status and General Wildlife
Page 4-69, Paragraph 2, line 4, replace reference to "Section 2.2.4.1" with "Section 2.2.2.12."

Page 4-70, First bullet, line 4, insert the following as the third sentence: "Similarly, open tanks containing oil or other adverse substances will be netted or otherwise secured to protect migratory birds."

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4.9 VISUAL RESOURCES

4.9.4 Impact Summary

Page 4-78. Paragraph 3, is replaced with the following: "Impacts to the visual resource would be slightly higher under Alternative A as discussed in Section 4.9.3.2.

4.11 SOCIOECONOMICS

4.11.3.1 Proposed Action

Page 4-83. After the first paragraph, add the following: "The proposed seasonal raptor nesting restrictions are not expected to shut down drilling activity in a large portion of the project area under the Proposed Action or Alternative B. The socioeconomic impacts presented in this analysis should reflect foreseeable impacts provided that the proposed artificial nesting structures are implemented for raptor mitigation."

4.11.3.1.3 Earnings

Page 4-84. Paragraph 1, line 3 is modified as follows: "The average annual wage..."

4.11.3.1.11 Local Government Fiscal Conditions

Page 4-88. State Severance Tax. First paragraph, sentences 3 and 4 are corrected as follows: The total state severance tax revenues generated by the Proposed Action over the ten year drilling program are estimated to be about $32.9 million. The estimated total state severance tax for the life of the project is estimated to be about $63 million.

Page 4-88. Replace the figures in the second column of Table 4-20 (Wyoming Severance Tax) with the following: 2.196,486, 3,244,053, 3,915,849, 4,386,105, 4,150,820, 3,590,996, 3,199,118; 2,924,004, 2,732,784, 2,598,370, 32,939,387.

Page 4-88. Mineral Royalties. Paragraph 1, sentence 4 is modified as follows: "gas royalties are illustrated in Table 4-20."

Page 4-89. First paragraph, last sentence is corrected as follows: "Total federal mineral royalties and state royalties over the life of the project are estimated to be $116.8 million and $6 million, respectively.

Page 4-91. County Ad Valorem Property Taxes on Production. First paragraph, sentence 3 is corrected as follows: "The total estimated as valorem property and production tax revenue for the life of the project is about $76 million..."

Page 4-91. Paragraph 2, line 2 is corrected as follows: "...as illustrated in Table 4-23."

Page 4-91. Revenue Impacts Summary. First paragraph, sentence 2 is corrected as follows: "Total revenues to all of these entities over the life of the project are estimated to be about $265 million."

4.11.4 Alternative A

Page 4-92. Replace the second and third paragraphs with the following: "The NSO restrictions and seasonal stipulations proposed under Alternative A would restrict drilling and unusual maintenance activities in about one third of the field and 67% of the 99 proposed well site locations during at least the February through May portion of the raptor nesting season (assuming that raptors are occupying the area). This would result in seasonal unemployment during that period for up to 63% of the estimated 172 FTEs directly employed on the project. (Drilling and field services represent about 63% of the total Wyoming oil and gas extraction employment.) The secondary effect of the reduced income and spending of direct project-related employees would be a reduction in secondary or induced employment in the Natrona County economy. The seasonal reduction in secondary employment could affect as many as 75 to 152 workers employed in secondary or induced jobs primarily in the retail and service sectors. This seasonal impact on secondary employment would be especially apparent in the highway 20/26 corridor.

The seasonal restrictions would result in a direct loss of income and workload seasonality for a number of oil and gas drilling and service businesses in Natrona County. The seasonal restrictions would make it difficult for many oil and gas drilling and service businesses to retain qualified workers. Seasonal employment opportunities may cause some of the unemployed workers in the oil and gas sector to temporarily or permanently relocate to find stable employment opportunities elsewhere. Replacement of these workers would likely result in increased training costs for many of the affected businesses and the reduced efficiency of less experienced workers. Employment of less experienced workers and the attempt to fit a year of drilling activity into 8.5 months may affect worker safety as well.

The seasonal loss of employment and income for households in Natrona County is very likely to cause additional family stress and related family and social problems. The seasonal restrictions would exacerbate the existing problems with underemployment and multiple job holding in Natrona County (see Section 3.11.3.5). Absentee wage-earners or reduced household incomes may place additional burdens on local social service agencies.

Increased seasonal unemployment and loss of income would result in increased government expenses for unemployment, food stamps, and other public assistance. Any associated increase in family stress or other social problems could cause additional expenses for state and local government social service agencies as well.

The potential out-migration of some Natrona County oil and gas workers and the concentration of activity during the mid-May through January time period may result in the need for more in-migrant workers to meet the seasonal employment demand during the open drilling period. Providing services to new residents would increase state and local government expenses for general government, education, law enforcement, etc.

Page 4-92. Fourth paragraph, lines 5 and 6 are corrected as follows: "...as illustrated in Table 4-23."

Page 4-92. Fifth paragraph, last sentence is corrected as follows: "The estimates of reductions in revenues associated with Alternative A are based on the portion of unrecoverable gas reserves that would likely be recovered without the NSO restriction, as under the Proposed Action (54.9 bcf)."

Page 4-93. Line 1 of the first paragraph after Table 4-24 is corrected as follows: "It is estimated that Alternative A would generate approximately $249 million in revenues for federal, state and local governments over the life of the project."
ADDENDUM AND ERRATA

4.11.5 Alternative B
Page 4-95 Table 4-25. Total Yearly Rentals is corrected from "$9.610.00" to "$9.510.00".

4.11.7 Impacts Summary
Page 4-96 Paragraph 1 is changed as follows: "Given the relatively few wells to be drilled annually under the Proposed Action and Alternatives A and B, the socioeconomic effects of the Proposed Action and Alternatives A and B would be largely positive. Anticipated tax revenues associated with the Proposed Action and Alternatives A and B would also be substantial."

Page 4-96 Paragraph 4 is added as follows: "The value of projected natural gas production from the Proposed Action and Alternative B would increase the total assessed valuation of Natrona County by about 18 percent by 1999 (compared to 1996 total assessed valuation). The increase under Alternative A would be about 16.7 percent. The estimated revenues to be received by the taxing entities in Natrona County including Natrona County School District would be significant in that their ability to provide services will be significantly enhanced relative to the potential increases in expense associated with Proposed Action or Alternatives A or B. The revenue impact is significant compared to the minimal in-migrant population anticipated to move into Natrona County.

The seasonal and year-round restrictions proposed for Alternative A would result in the following adverse socioeconomic impacts (compared to the Proposed Action and Alternative B): reduced incomes, reduced tax revenues, seasonal unemployment, compressed development schedules, worker dissatisfaction and potentially increased in-migration."

4.12 TRANSPORTATION

4.12.4 Alternative A
Page 4-99 Paragraph 1, line 6 is modified as follows: "impacts presented in Table 4-26."

4.14 NOISE

Section 4.14.3.1 Proposed Action
Page 4-105 Paragraph four, line 9 reference is corrected to read: "(Montana Board of Oil and Gas Conservation 1989, p. 126)."

Page 4-105 Paragraph 1, last line reference is corrected to read: "(Montana Board of Oil and Gas Conservation 1989)."

ADDENDUM AND ERRATA

CHAPTER 5
CUMULATIVE IMPACTS ANALYSIS

5.1 PROPOSED ACTIVITY AND ACTUAL ACTIVITY REASONABLY FORESEEABLE IN THE PROJECT AREA
Page 5-2 Paragraph 2, line 4 is modified as follows: "Therefore, future surface disturbance in the project area..."

5.3 AIR QUALITY
Page 5-3 Based on new information obtained after the DEIS was published, Section 5.3 (Air Quality) has been fully re-written, and appears in Section 2.2 Addendum: Air Quality above.

5.4 SOILS

5.4.1 Introduction
Page 5-6 Paragraph 1, line 3 is corrected to read: "... such other actions or projects (40 CFR 1508.7)."

Page 5-9 Table 5-1. All references to area are in "acres."

Page 5-10 Table 5-2. All references to area are in "acres."

5.8 WILDLIFE

5.8.1 Pronghorn Antelope
Page 5-17 Add the following text, as an introductory paragraph: "Impacts to pronghorn were assessed over each of the four herd units that the Cave Gulch-Bullfrog-Waltman project area is a part of. These include the 883.744-acre North Natrona herd Unit, the 660.160-acre Badwater Herd Unit, the 2,882,496-acre Beaver Rim Herd Unit, and the 656.192-acre Rattlesnake Herd Unit. No development activities are proposed for the Rattlesnake Herd Unit."

5.8.2 Mule Deer
Page 5-19 Add the following text, as an introductory paragraph: "Impacts to mule deer were assessed over the four herd units that the Cave Gulch-Bullfrog-Waltman project area is a part of. These include the 848.768-acre North Natrona Herd Unit, the 788.544-acre Rattlesnake Herd Unit, the 904.768-acre Beaver Rim Herd Unit, and the 2,161.500-acre Southwest Bighorn Herd Unit. Designated mule deer habitats do not occur within the portions of the Project Area that lie within the Southwest Bighorn and Beaver Rim Herd Units and no development activities are proposed for the Rattlesnake Herd Unit."
ADDENDUM AND ERRATA

5.8.4 Raptors

Summary and Discussion

Page 5-26. Paragraph 1, line 2 is modified to read: "...which is determined by the availability of suitable nesting structures."

Page 5-26. Last paragraph, beginning with line 5 modify as follows: "When both prey base and suitable nesting structures...as several square miles (Call 1989 and 1994)."

Page 5-27. Paragraph 2, line 4 is modified as follows: "...a finite quantity of suitable nesting areas..."

Page 5-27. Paragraph 2, lines 6, 7 and 8 are modified to read: "...availability of suitable natural...the placement of elevated ANSs in suitable locations...in otherwise suitable areas where no natural structures exist..."

Page 5-27. Paragraph 2, last sentence is modified as follows: "...would be expected to accept properly located ANS during the first year (Call 1988 and 1989)."

Page 5-27. Insert the following text between paragraphs 2 and 3. "The BLM will ensure that appropriate raptor mitigation measures, that are as effective as those described in this EIS, are applied to other oil and gas operations (such as Cooper Reservoir) within the GRAA."

Page 5-27. Paragraph 4, mousy sentence 1 as follows: "Given the application of mitigative procedures described in Sections 4.7.5.2 and 2.2.2.12, and in the paragraph preceding this one,..."

5.12 SOCIOECONOMICS

Page 5-29. Paragraph 2 is modified beginning with sentence 2 as follows: "Over the life of the project, it is estimated that all project activities would have a positive, cumulative impact of $265 million on government revenues under the Proposed Action and Alternative B. The estimated cumulative impact on government revenues is $249 million under Alternative A."

Page 5-30. Fifth bullet. Replace the last two sentences with the following: "An exploratory drilling permit for 5 core holes was authorized in February 1997, and the testing program is underway to determine if a quarry on the west end of the Rattlesnake Mountains would contain the quantity and quality of material needed to cover the tailings. No quarry application or proposal has been submitted, after the testing is completed. UMETCO will decide if a quarry application should be pursued. There is no estimate for when their decision will be reached."

5.16 SUMMARY OF COMPARATIVE AND CUMULATIVE IMPACTS

Page 5-33. Table 5-8. Summary of Comparative and Cumulative Impacts, Air Quality, second column (Proposed Action), fourth row (Worst Case Visibility Reduction: Cloud Peak Class II Wilderness), replace "0.45 deciview" with "0.5 deciview" [NOTE: new value based on revised cumulative air quality impact assessment in Section 5.3 (Air Quality).]

Page 5-37. Socioeconomics Section of Table 5-8 is corrected as follows: "Federal Mineral Royalties (life of project) for the Proposed Action = $116.8 million. Federal Royalties Returned to the State (life of project) for the Proposed Action = $58.4 million."

CHAPTER 6
PUBLIC PARTICIPATION, CONSULTATION, AND COORDINATION

6.2 LIST OF PREPARERS

Page 6-10. Table 6-4, Wyoming State Office, first and second columns (Name and Title), fifth row, replace "Wyoming State Office, Scott Archer, Air Quality Analyst" with "National Applied Resource Sciences Center, Scott F. Archer, Senior Air Resource Specialist."
ADDENDUM AND ERRATA

GLOSSARY

Page GL-1. Delete "airshed: A geographic area that shares the same air because of topography, meteorology, and climate." Page GL-1. Add the following to the list of definitions: "Best Management Practices (BMPs): Relative to soils, water, and vegetation resources (including reclamation) this is a practice or combination of practices that are determined to optimize the reduction and/or avoidance of adverse impacts to acceptable non-significant levels. Such practices are practicable in regard to technological, economic, and strategic considerations. In general, BMPs incorporate operator standard operating practices, but usually go further towards reducing or avoiding an adverse impact." Page GL-5. Paragraph 10 (injection well) is modified as follows: "... reservoir pressure; can also be used to dispose of produced water." Page GL-6. Paragraph 7 (mineral rights) is replaced with the following: "rights of ownership, conveyed by deed, of gas, oil, and other minerals beneath the surface of the earth. In the United States, mineral rights are the property of the surface owner, unless disposed of separately." Page GL-7. Replace: "Prevention of Significant Deterioration (PSD): A regulatory program under the Clean Air Act (P.L. 84-159, as amended) to limit air quality degradation in areas currently achieving the National Ambient Air Quality Standards. The PSD program established land management classes in which differing amounts of additional air pollution above background (or baseline) conditions would be considered significant. Almost any additional air pollution would be considered significant in PSD Class I areas (existing large National Parks and Wilderness Areas), PSD Class II areas allow that deterioration associated with moderate, well-controlled growth (most of the country, outside of nonattainment areas)." Page GL-8. Add the following to the list of definitions: "reserved mineral rights: Reserved mineral rights are the retention of ownership of all or part of the mineral rights by a person or party conveying land to the United States. Conditions for exercising these rights have been defined in the Secretary's Rules and Regulations to Govern Exercising of Mineral Rights Reserved in Conveyances to the United States attached to and made a part of deeds reserving mineral rights." GL-9. Modify the definition of stipulation as follows: "A legal requirement, specifically a requirement that is a part of the terms of a mineral lease or a right-of-way grant. Some stipulations are standard on all federal leases and right-of-way grants. Other stipulations may be applied to the lease or grant at the discretion of the surface management agency to protect valuable surface resources." Page GL-10. Paragraph 16 (wellbore) is replaced with the following definition: "wellbore: A hole drilled by the drill for which it may be open (uncased), or a portion of it may be cased, and a portion of it may be open. Also called borehole or hole."
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ADDENDUM AND ERRATA

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Figure 2-9. Typical Production Facilities Layout for a Twin Well.
Figure 3-21. Transportation Routes within the Cave Gulch-Bullfrog-Waltman Project Area.
SECTION 3 - CONSULTATION AND COORDINATION

3.1 SCOPING PROCESS
On March 19, 1996 the BLM published in the Federal Register a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS). The scoping statement provided information on the major FERC authority and objectives of the proposed natural gas development project, as well as the criteria that would establish the level of activity that would be allowed while the EIS was underway. Copies of the scoping statement were mailed to the media, governmental agencies, environmental organizations, industry representatives, authorized public land users, individuals, landowners and grazing permitees.

The joint public meeting and open house was attended by 248 persons. Of that, 30 persons gave public statements. Some 53 scoping comment letters were received during and after the comment period. All comments were incorporated into the analysis of issues identified in the DEIS.

The issues were: the BLM should allow interim development while the EIS was prepared; concerns on too many or too few studies and monitoring; concerns with recreation and wildlife management; the consideration of the social-economic benefits from the proposed action; alternatives to the proposed action; the size of the area of analysis; correlative issues (drainage issues); and general questions on the process for preparing an Environmental Impact Statement.

3.2 DRAFT EIS CONSULTATION AND COORDINATION
The BLM consulted with the Department of Interior U.S. Fish and Wildlife Service and the Wyoming Game and Fish Department on issues, impacts and mitigation for raptor and other wildlife populations and habitats, and consulted with the Department of Environmental Protection Agency, the U.S. Forest Service and Wyoming Department of Environmental Quality on issues, impacts and mitigation for air quality. Through various workshops and meetings, the BLM consulted and coordinated with local, state, and county government officials. Native American Indian tribes were provided notices of the proposed project.

3.3 PUBLIC REVIEW OF DRAFT EIS
On February 14, 1997, The Environmental Protection Agency’s Notice of Availability was published in the Federal Register. Over 600 copies of the draft EIS were made available to the public and interested agencies for a 45-day public comment period. The date by which the comments had to be received was April 1, 1997. On February 20, 1997, the BLM published a Federal Register Notice of availability and notice of an open house and public meeting scheduled for March 11, 1997 to accept comments and address questions. Two press releases were issued. On February 12, 1997, a press release was issued announcing the availability of the Draft EIS, a summary of the analysis and alternatives, the deadline for comments, and announcing the scheduled March 11, 1997 public meeting and open house. On March 3, 1997, a follow up press release was mailed to the media on the meeting set for the DEIS. Of the 136 persons who attended the public meeting,

CONSULTATION AND COORDINATION

29 persons provided verbal comment. A transcript of the meeting comments is available for public review at the Casper District Office, 1701 East Street, Casper, WY.

Of those commenting, nine persons followed-up with a written comment. To locate the letter, please refer to Section 4 - Comment Letters Received on the Draft EIS. The letters have each been given a unique identifying number. Substantive comments requiring a response are identified by comment number associated with heavy vertical lines in the margin of each letter. The written comments have been reproduced with a corresponding response. The written comment from Bob Tanner is in index letter number 1. Fred Klein is in index letter number 8. Roy Guess' written comment is in index letter number 10. Pat Childers is in index letter number 11. Carolyn Plasseaux's is in index letter number 37. Chairman of the Natrona County Commissioners Bill Brauer's, Natrona County Commissioner Marion Bouzis' and Natrona County Treasurer Gary Widup's written comments are contained in index letter number 50, and Renee Taylor's written comment is in index letter number 56.

At the meeting, the following persons commented but did not submit written comments. Those persons who expressed the same or very similar concerns were: Ron Kidder, Rick Bonder, Fred Klein, Bill Schilling, Bob Tanner, Marlon Jones, Mike Schill, Steve Sasser, Greg Ball, Jim Hartnett and Rich Mahar. These individuals commented on the importance of the taxes and employment that would result from the project and expressed concerns with the loss of revenues and jobs if six month seasonal stipulations were applied. Ralph Meyers commented with similar concerns, but also questioned the scenic value of the area. Chuck Moran had similar concerns, but also questioned if the leaseholders of the set-aside or Key Raptor Area had been notified. Fred Brunner had similar concerns, but also questioned the intent of The National Environmental Policy Act and the recreational impacts of the project in the area. Robert Hendry had similar concerns, but questioned the BLM's failure to sign a cooperating agency agreement with the Natrona County Commissioners and also suggested the Coffman Ranch be used as an alternative to the proposed Key Raptor Area.

Comments expressed at the meeting that varied from the general comments on economic value of the project and concerns with seasonal stipulations were made by Charles Scott, who questioned the predicted impacts to the raptors in the area. Michael Hauck responded to the seasonal restriction comment with a clarification, and said the seasonal stipulations imposed by BLM to protect raptor nesting sites are not for the entire field but only for occupant BLM. Hendry asked BLM to examine the available utility base for birds in the area, and Bruce Lawson commented that the impact to raptors could be mitigated.

All of the comments received during the public comment period and during the public meeting have been considered in the preparation of the final EIS. Responses to all the comments expressed during the public meeting can be found in Section 5 entitled Response to Public Comments on the Draft EIS, except for Mr. Hendry's comment. He recommended in place of the BLM proposed Key Raptor Area, the BLM use sections of the Coffman Ranch as a set-aside area. BLM, through a land exchange, recently acquired sections of deeded land identified as the Coffman Ranch. Mr. Hendry asked BLM to examine a one square-mile area on black ridge near a homestead area where he had spotted a number of raptors.

The area described is outside the northcentral end of the GRAA, and outside of the GRAA. Data provided by the GRAA raptor inventory show that there is a concentration of raptor nests in the northcentral end of the GRAA. Much of this area north of this nest concentration, outside of the GRAA, has not been inventoried for raptor nests. The "black ridge" would provide a similar kind of biological compensation but to a lesser extent as described for the proposed KRA in the DEIS at page 4-68. See also the response to comment 19-2. The "one square mile" recommended in this
3.4 DRAFT EIS COMMENTS

A total of 65 comment letters were received on the draft EIS, 11 of which were received after the 45 day public comment period that ended on April 1, 1997. In the draft EIS, the BLM stated that comments received after the comment period may be considered in preparing the final EIS but may not be included in the set of comments reproduced for the final EIS. But, because several of the comments received after April 1, 1997 were substantive in nature, we determined that all the letters would be reproduced. Responses were prepared to comments in the letters received after April 1 (letters numbered between 55 and 65) that were new and specific to suggested changes, sources or methodologies. Those comments that were similar in nature as other comments received are referenced back to similar comments and responses in the document.

Responses to public comments received on the draft EIS are included in this final EIS. In many cases respondents submitted virtually identical comments. Rather than repeating a response, the reader may be referred to an earlier response. Reference to a previous response in no way reflects upon the value of the comment.

The comment letters and responses to the comments are contained in Section 5 entitled Response to Public Comments on the Draft EIS following the reprinted letters. Comments are numbered sequentially within a letter and correspond to the numbered response.

Issues of public concern were the potential loss of revenue to the state, county and city government due to the seasonal raptor stipulations for the area, lack of analysis of the cumulative affects of general development on wildlife and air quality, and the BLM’s proposed KRA, or set-aside area, for raptor management, and, the federal government’s policy of not granting cooperating agency status to Natrona County.

Specific changes in the text of the draft EIS are found in Section 2 of the final EIS. Where a response to a comment indicates “see Errata”, Section 2 of the final EIS should be consulted for the specific wording or clarification of the text.

3.5 COMMON CONCERNS

Respondents shared several common concerns about the proposed drilling project. These concerns are summarized here, as well as in the responses to individual letters.

General Comment A. The cumulative impacts to air quality resulting from the Cave Gulch-Bullfrog-Waltman Natural Gas Development Project and numerous other proposed oil and gas activities in central Wyoming are not being adequately evaluated.

The assessment of air quality impacts provided in the DEIS considered cumulative impacts from the standpoint of assessing the potential impacts from all existing, proposed, and reasonably foreseeable sources of emissions. The DEIS analyzed potential cumulative air quality impacts for only those additional sources which were not adequately represented by the background condition (such as sources permitted but not yet operational) and have the potential to cause “cumulative” impacts for the same air pollutants with the Proposed Action and Alternatives. Further information is documented in the "Cumulative Air Quality Impact Analysis Technical Support Document" (February 1997) and Section 5.3 Air Quality of the DEIS.

Following completion of the Draft EIS, information was provided to BLM regarding other proposed and ongoing development activities within the Cave Gulch-Bullfrog-Waltman air quality cumulative impact analysis area. Based on the information obtained after the DEIS was published, a supplemental cumulative air quality impact analysis has been conducted. Section 5.3 of the DEIS (Cumulative Impacts Analysis - Air Quality) has been fully re-written, and appears in Section 2, Addendum and Errata of the FEIS. The supplemental Cumulative Air Quality Impact Analysis is appended to the FEIS in Appendix A.

General Comment B. The combined amount and type of mitigation restrictions proposed in the DEIS for the protection of raptors are excessive and will result in project construction and development crews unable to work during six months of the year.

A wide range of mitigation alternatives was presented in the EIS, including seasonal restrictions and buffer zones for raptor nests, the provisions of a proposed Key Raptor Area (KRA), and the construction of artificial nest structures (ANSs). The mitigation actions were proposed on the basis of their adequacy to offset the impacts anticipated from the proposed action and alternatives, and to comply with federal laws, state statutes, and BLM policy. Seasonal restrictions and buffer zones are applied to active raptor nests to avoid the disturbance of nesting raptors and to prevent the violation of federal laws and state statutes which protect raptors and their nests. The biological basis and need for such protection is well established and documented in the scientific literature.

Under the Proposed Action or Alternative B, due to the relatively small number of active nests, seasonal restrictions and buffer zones would be applied to only a small proportion of the project area during development and would rarely be in effect for the full six months. The number of active nests is likely to be further reduced as birds are displaced from the project area and alternative nesting opportunities in the GRAA become available through the erection of ANSs. As this process occurs, the need for seasonal restrictions on the project area would progressively diminish.

The advantages and disadvantages of each of the mitigation alternatives were analyzed in the DEIS in order to provide a basis for comparison that would provide perspectives necessary for the BLM to render informed final decisions in the ROD regarding which mitigation actions or combination of actions best balances the entire spectrum of resource needs while still complying with applicable laws, statutes, and policies.

General Comment C. The DEIS did not adequately analyze the socioeconomic impacts of the seasonal restrictions for the Proposed Action and Alternatives.

A number of respondents were under the mistaken impression that development activities in the entire field would be restricted for six months each year during the raptor nesting season. Management of field development activities has been more restrictive during preparation of the EIS than is expected for the Proposed Action or Alternatives.

Of the alternatives considered, Alternative A would place the most restrictions on development activities. Seasonal employment and income effects are likely to occur under the restrictions.
proposed for Alternative A. Clarifications of the potential socioeconomic impacts of the seasonal restrictions expected for the Proposed Action and Alternatives A and B are provided in the errata items for Section 4.11.3.1 and Section 4.11.4.

**General Comment D.** The DEIS did not adequately identify the significance of the potential revenue impacts of the Proposed Action and Alternatives on Natrona County and the Natrona County School District.

The DEIS (Section 4.11.3.1.11) provides a detailed discussion of the amount and types of tax revenues which would be generated by activities associated with the Proposed Action and alternatives. The amount of tax revenue anticipated to result is considerable. These revenues were described in the DEIS as substantial. Sections 4.11.4 and 4.11.5 compare the anticipated tax revenues which would be generated under the Proposed Action and Alternatives A and B.

**General Comment E.** The BLM failed to designate Natrona County as a "Cooperating Agency" under the National Environmental Policy Act (NEPA) and the Council on Environmental Quality Council regulation even though precedence has been set in other states and counties.

The Bureau of Land Management encourages cooperation and is willing to develop a written agreement for the County’s participation, however such an agreement cannot include provisions for the County to have joint decision making authority over Federal land and resource uses and management, to require BLM to compensate the County and its agents for their involvement, or provide the County exclusive or separate review and comment opportunities on any phase of EIS development separate from any other public reviews and comment periods. The decision not to sign the "cooperating agency" agreement as drafted and submitted by Natrona County was made based upon legal advice from the Bureau of Land Management Department of Interior Solicitors because the draft agreement breached these legal parameters. The BLM/County agreements signed in other States have set no precedence, as stated, because they are within these legal parameters.
SECTION 4 - COMMENT LETTERS RECEIVED ON THE DRAFT EIS

4.1 INTRODUCTION

The following comment letters were submitted by the public and interested agencies on the Cave Gulch-Bullfrog-Waltman Natural Gas Development Project Draft EIS. The 45 day comment period was February 14, 1997 through April 1, 1997.

Of the 65 comment letters on the draft EIS, 11 were received after the comment period. In the draft EIS, the BLM stated comments received after the comment period may be considered in preparing the final EIS but may not be included in the set of comments reproduced for the final EIS. But because several of the comments received after April 1, 1997 were substantive in nature, we decided it was in the public’s best interest to reproduce all the letters. Responses were prepared to comments in the letters received after April 1 (letters numbered between 55 and 65) that were new and specific to suggested changes, sources or methodologies. Those comments that were similar in nature as other comments received are referenced back to similar comments and responses in this section of the document.

All 65 comment letters received have been reproduced in this section. Each letter is given a unique identifying number. Substantive comments requiring a response are identified by comment number associated with heavy vertical lines in the margin of each letter. For instance, comment No. 3-2 is the second comment on comment letter No. 3 requiring a response. All responses are presented in the following Section 5. Each response identifies the letter and comment number that it is associated with.
February 21, 1997

Ms. Kate Padilla
B.L.M. Team Leader
Cave Gulch Natural Gas Dev. Project 528
B.L.M. Plate River Resource Area Office
P.O. Box 2420
MILLICAN, WY 82044

Dear Ms. Padilla,

After review of the draft EIS pertaining to Cave Gulch-Bullfrog-Waltman Natural Gas Development project I wish to submit the following comments for consideration. As a long time resident of Wyoming and concerned with future development in our state, I feel it is imperative that this project be approved as proposed by the operations. The proposed alternatives as presented in the EIS will hinder the project to the point of non-feasibility.

The project as presented will not have a long-term impact on raptors or wildlife contrary to other opinions. Although there may be some short-term displacement of wildlife and raptors in the initial stage of operations, the inhabitants will return as they become accustomed to the activity. As many as an average of one bird through the year will occur in the project area. As the program progresses, the raptors and wildlife continue to congregate nearby. The area encompassed by the project is a relatively small area of disturbance, less than eight hundred acres, and only fifty percent of the required disturbance will be relinquished to original or better than original habitats.

Many in our society want to protect the resources in the point of use. While they advocate converting others from using public land, they present no regulations restricting their use of the land. I feel it is in the best interest of all concerned to approve this project as original proposed, since there are already many migratory species in place. The buffer zones are more than adequate, and decreasing them will only hinder the project.

Respectfully submitted,

Lyle L. Woricted

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Ms. Kate Padilla
B.L.M. Team Leader
Cave Gulch Natural Gas Dev. Project 528
B.L.M. Plate River Resource Area Office
P.O. Box 2420
MILLICAN, WY 82044

Dear Ms. Padilla,

I am writing this letter in support of the Cave Gulch-Bullfrog-Waltman Natural Gas Development Area. We have studied the Draft EIS and believe that the concerns for wildlife, raptors, and air quality have been adequately addressed. Industry has taken on the challenge to coexist with the environment and go above and beyond standard measures to assure compliance. We view the idea that a few raptors that nest in the area will be disturbed to be laughable and misleading. Our company has been hauling oil field equipment in Wyoming for the past 20 years. On numerous occasions we have witnessed a large number of raptors and other wildlife fly directly over our operations. We have never seen or heard of any adverse impact on wildlife or air quality.

The positive socio-economic impact that the project will have on the adjacent areas will far outweigh any assumed adverse impact on wildlife. It is our hope that common sense will prevail so that the final EIS and the record of decision will be issued and subsequently signed by the State Director.

Thank you for accepting this letter.

Sincerely,

Mike Wilhelmson
President

Mike Wilhelmson Trucking Inc.
281 License Dr.
Rock Springs, WY 82901
Feb 25, 1997

---

Barbara Tamer
Cave Gulch-Bullfrog-Waltman Natural Gas Development Project Final EIS - June 1997
COMMENT LETTERS RECEIVED ON THE DRAFT EIS

March 28, 1997

STATEMENT FOR THE RECORD

Bureau of Land Management, Denver Field Office, PO Box 8541, Denver, CO 80201

The Bureau of Land Management (BLM) is considering the impact of the

Snowmass Feasibility Project (SFP) on the fee-simple lands within the area
affected by the SFP. The SFP is a proposed development project that includes
the construction of ski lifts, roads, and other facilities for recreational use.

The SFP is located in the Snowmass area, which is a part of the</noscript><br />

Cave-Gulp-Buford-Waltman Natural Gas Development Project Final EIS - June 1997

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Cave-Gulp-Buford-Waltman Natural Gas Development Project Final EIS - June 1997

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Wyoming State Legislature

March 17, 1997
Karen Buckley
Office of the Governor
1701 East 3rd Street
Cheyenne, WY 82001

Dear Ms. Buckley:

The EIS presented herein is a response to a petition for consideration of the South Wyoming Groundwater Development Project in order to enhance the water supply for the City of Cheyenne, Wyoming. The petition was signed by Mr. J. Robert Babich, Manager of the Colorado River Basin Planning Office in Denver, Colorado. The petition was dated January 21, 1997, and was submitted on behalf of the City of Cheyenne, Wyoming.

The petition requests that the Secretary of the Interior, through the Bureau of Land Management, issue a letter of conditional approval to the City of Cheyenne, Wyoming, for the development of the South Wyoming Groundwater Development Project. The petition states that the project is necessary to meet the water supply needs of the City of Cheyenne, Wyoming, and that the project is consistent with the Water Rights Act of 1923.

I am enclosing a copy of the petition for your information. If you have any questions or need further information, please contact me at 307-777-9500.

Sincerely,

Gregory S. Davis
Governor

March 17, 1997

Karen Buckley
Office of the Governor
1701 East 3rd Street
Cheyenne, WY 82001

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I am enclosing a copy of the petition for your information. If you have any questions or need further information, please contact me at 307-777-9500.

Sincerely,

Gregory S. Davis
Governor
COMMENTS RECEIVED ON THE DRAFT EIS

I. INTRODUCTION

II. IMPACTS

3.2 Natural Gas Development

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Section 10.1.1.1.1

Page 42

3.2.2.5

Page 41-42

4.6.2.1

Page 43

4.6.4

Page 43-44

III. COMMENT LETTERS RECEIVED ON THE DRAFT EIS

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COMMENTS RECEIVED ON THE DRAFT EIS

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Cave Gulch-Buffalo-Waltman Natural Gas Development Project Final EIS - June 1997

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COMMENT LETTERS RECEIVED ON THE DRAFT EIS

Delaware Natural Resources 
Bureau of Land Management 
Office of Management and Budget 
Washington, D.C. 20501

March 31, 1997

Mr. Dean A. Feldman 
Commissioner of the Forest Service 
U.S. Department of Agriculture 
1100 East 16th Street 
Custer, WP 82031

Dear Mr. Feldman:

Champion papers the BLM's forthcoming efforts to assure that the analysis and the decision regarding this project is influenced and shaped to reflect the public's views to the greatest extent possible. In this regard, Champion reminds the Forest Service that in many respects, impaired the process, seriously impeding the integrity of the BLM's process and the Forest Service's process.

As I stated earlier, we are concerned that the Forest Service was not involved in the development of the BLM EIS in any meaningful manner. As a result, the public's comments and concerns, which are so important to the decision-making process, have not been adequately addressed.

Thank you for your attention to this matter.

Sincerely,

Robert J. Taylor

Chairman of the Board

Champion Paper Group

BURLINGTON

Champion Paper Group

1030 East 16th Street

Custer, WP 82031

Page 4 of 28

Cav8Uul;h - Waltman Natural Gas Development Project Final EIS - June 1997

Cav8Uul;h - Bullfrog-Waltman Natural Gas Development Project Final EIS - June 1997

Page 4 of 29
Chevron recommends that PAGADCO BNLI personnel at the very least attempt to develop a proposal. Although the proposal should be based on a detailed and realistic evaluation of the feasibility of the range of alternative proposed for analysis in the ES.

45-2 (part)

Chevron recommends that PAGADCO BNLI personnel at the very least attempt to develop a proposal. Although the proposal should be based on a detailed and realistic evaluation of the feasibility of the range of alternative proposed for analysis in the ES.

45-3 (part)

Chevron recommends that PAGADCO BNLI personnel at the very least attempt to develop a proposal. Although the proposal should be based on a detailed and realistic evaluation of the feasibility of the range of alternative proposed for analysis in the ES.

45-4 (part)

Chevron recommends that PAGADCO BNLI personnel at the very least attempt to develop a proposal. Although the proposal should be based on a detailed and realistic evaluation of the feasibility of the range of alternative proposed for analysis in the ES.

45-5 (part)

Chevron recommends that PAGADCO BNLI personnel at the very least attempt to develop a proposal. Although the proposal should be based on a detailed and realistic evaluation of the feasibility of the range of alternative proposed for analysis in the ES.

45-6 (part)

Chevron recommends that PAGADCO BNLI personnel at the very least attempt to develop a proposal. Although the proposal should be based on a detailed and realistic evaluation of the feasibility of the range of alternative proposed for analysis in the ES.

45-7 (part)

Chevron recommends that BNLI personnel should be included in the draft EIS and the analysis of the environmental impacts as to the human population in the area of the project. This will provide a better understanding of the environmental impacts of the project and help to ensure that the project complies with all relevant regulations and guidelines.
COMMENT LETTERS RECEIVED ON THE DRAFT EIS

Chevron recommends that BLM consider impacts to, and mitigation for, areas that is consistent with, the best available science. A cumulative assessment of environmental impacts and opportunities for improvement around the proposed Project area and alternatives for the project is required. The proposed Project area and alternatives must be described in the EIS.

BUI recommends that the Project area be developed in a way that minimizes the negative impacts to wildlife and the environment. BUI suggests that the EIS include a thorough analysis of the potential impacts of the proposed Project on the environment, and that the analysis be based on the best available scientific evidence.

Proposed mitigation measures include the establishment of a monitoring program to assess the project's impact on wildlife and the environment. The monitoring program would include regular surveys of the affected areas to assess the effectiveness of the mitigation measures.

GENERAL DISCUSSION OF ALTERNATIVES

The alternatives considered for the Project area are the Proposed Project, which is the most likely to be selected, and two other alternatives: the No-Project Alternative and the Reduced Impact Alternative. The No-Project Alternative involves no new construction or operation on the Project area. The Reduced Impact Alternative involves some new construction or operation on the Project area, but with reduced impact on the environment.

The Reduced Impact Alternative includes measures to reduce the project's impact on wildlife and the environment. These measures include the establishment of a buffer zone around the Project area, and the use of alternative technologies that minimize the impact on the environment.

Cave Gulch-Buford-Wattman Natural Gas Development Project Final EIS - June 1996

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Cave Gulch-Buford-Wattman Natural Gas Development Project Final EIS - June 1996

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Page 42
COMMENT LETTERS RECEIVED ON THE DRAFT EIS

PETROLEUM ASSOCIATION OF WYOMING

March 27, 1986

10101 Westheimer Rd
Houston, TX 77077

Mr. Jerry E. Christiansen
Environmental Protection Agency
Washington, DC 20460

Dear Dr. Christiansen:

I am writing to express the Petroleum Association of Wyoming's concern with the draft EIS for the Cabe Gulch-Buffalo-Waltman Natural Gas Development Project Final EIS.

The Petroleum Association of Wyoming is the trade association representing the oil and natural gas industry in the state of Wyoming. We are concerned with the potential impact of this project on the environment and the economy of the region. We believe that the draft EIS does not adequately address these concerns and deserve the right to be heard. We believe that the project should be commensurate with the objectives of President Reagan's energy policy, which is to increase domestic energy production while protecting the environment.

We urge you to consider our comments and to ensure that the final EIS properly addresses these concerns. If you have any questions or need further information, please do not hesitate to contact me.

Sincerely,

[Signature]

[Name]

[Title]

Petroleum Association of Wyoming
COMMENT LETTERS RECEIVED ON THE DRAFT EIS

Page 1

47-9

Electronically: EPA recommends the 373 square miles proposed area for ANA be returned to the

Non-Contiguous area.


Page 2

47-10

At the time of the meeting, the draft EIS was returned to the

373 square miles proposed area for ANA.


Page 3

47-11

The Front Range: A Plan for the

During the meeting, the draft EIS was returned to the

373 square miles proposed area for ANA.


Page 4

47-12

The draft EIS was returned to the

373 square miles proposed area for ANA.


Page 5

47-13

The draft EIS was returned to the

373 square miles proposed area for ANA.


Page 6

48-1

The draft EIS was returned to the

373 square miles proposed area for ANA.


Page 7

48-2

The draft EIS was returned to the

373 square miles proposed area for ANA.
COMMENT LETTERS RECEIVED ON THE DRAFT EIS

March 31, 1997

Sharon R. Buntman
Environmental Management
Cape Cod
Tentative 92-4
Cape, NY 11308

Re: Cave Gulch-Buffalo-Wyoming Draft EIS

Letter and Comments:

I would like to thank you for the effort that was put into the environmental studies of this project. I am not understanding why such a large area was to be studied. However, with the data now available, the approach looks excellent. There were several areas where the property appeared, or seemed to be at 11 and 12.

SUSPENSE

Page 5-5 of the draft EIS

Paragraph 1.2.3 of the draft EIS

"Alterations in the Proposed Action, as determined from the agency process and issues of concern, were identified through preliminary comments and the environmental review process and formal and informal agency review. For example, the primary elements described in the draft EIS, including the draft EIS.

SIGNIFICANT IMPACTS

All throughout the process, the EIS has emphasized assessing and identifying significant impact. It is knowing an absolute to the draft document, in the result of EIS, the "significant element" as the only cause in the report area. There is an extremely significant impact in the project that I came.

Robin M. Land Management
March 31, 1997

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Comm.

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COMMENT LETTERS RECEIVED ON THE DRAFT EIS

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SUPERMOM

D E B O R A H  W I L L I A M S  N E W H A U S  E N D R U

SUPERMOM

WYOMING WOOL GROWER ASSOCIATION

June 16, 1997

Dear Mr. Williams:

Following the comments of the Wyoming Wool Growers Association, it appears to the

EIS must be revised to meet the comments of the Wyoming Wool Growers Association.

Best regards,

Sincerely,

July 1, 1997

June 16, 1997

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Cave Gulch-Bullfrog-Waltman Natural Gas Development Project Final EIS - June 1997
COMMENT LETTERS RECEIVED ON THE DRAFT EIS

Wyoming Outdoors Council
P.O. Box 360
Cheyenne, WY 82003

April 16, 1997

Dear Chairs and Members of the Wyoming Outdoor Council:

I am writing to express my support for the Caribou National Grassland Management Plan (DRAFT EIS) currently being considered by the Council.

As you know, the Caribou National Grassland is a unique and valuable resource that offers a wide range of opportunities for outdoor recreation and wildlife habitat. The draft EIS presents a comprehensive approach to resource management that aims to strike a balance between these competing interests.

I believe that the draft EIS is a well-researched and thoughtful document that takes into account the diverse needs and concerns of the local community. It provides a framework for sustainable management that will benefit future generations.

I encourage you to carefully consider the comments and concerns that have been raised in the public comment period, and to make considered decisions that reflect the best interests of the Caribou National Grassland and its visitors.

Sincerely,

[Your Name]

Best Copy Available

Cave Gulch-Bulbog-Waltman Natural Gas Development Project Final EIS - June 1997 Page 4-57
SECTION 5 - RESPONSE TO COMMENTS

Responses to comments are organized by responder and are numbered in the order received. Page and section numbers, unless otherwise noted, refer to the draft EIS issued in February 1997.

BOB TANNER

Comment 1-1: Thank you for your comment.

DEPARTMENT OF THE ARMY

Comment 2-1: Thank you for your comment. Waters of the U.S., including special aquatic sites and wetlands are identified at the reconnaissance-level in Section 3.5 of Chapter 3 (page 3-39), Figure 3-6 (page 3-41), and in the Soils, Water, and Vegetation Resources Technical Report (ECOTONE 1997). Section 4.4.5, bullet #6 (page 4-41); Section 4.5.2, bullet #6 (page 4-43); Section 4.5.3.1, page 4-45, paragraph #1; and Section 4.5.5, bullet #6 (page 4-49) describe the requirements of the Operators pursuant to Section 404 of the CWA.

LYLE E. WOELICH

Comment 3-1: Thank you for your comments. Any restrictions relating to the alternatives to the proposed action will be included as a decision within the Cave Gulch ROD.

Comment 3-2: Thank you for your comment. The relative merits and disadvantages of the Proposed Action and each of the alternatives are presented in the analysis of the EIS and in the public comments. The BLM will consider these advantages and disadvantages in formulating the perspectives required to make informed decisions for the ROD.

MIKE WILKINSON TRUCKING, INC.

Comment 4-1: The conclusion that the proposed activities will, in the absence of appropriate mitigation, impact raptors was based on careful analysis of known facts and documented research.

Comment 4-2: The positive socioeconomic impacts of the Proposed Action and alternatives are described in the Section 4.11 of the DEIS. No attempt has been made to determine the economic value of any potential wildlife impacts.

LARRY PENNOCK

Comment 5-1: Thank you for your comment.

WEATHERFORD ENTERRA U.S., INC.

Comment 6-1: Management of the project area during preparation of the EIS has been more restrictive than is expected under the Proposed Action or Alternatives B or C. The impacts of the seasonal and year-round restrictions proposed for the Proposed Action and Alternatives A and B on the Natrona County economy are discussed in more detail in the Errata for Sections 4.11.3.1 and 4.11.4.
RESPONSE TO COMMENTS

CAMERON
Comment 7-1: See response to comment 6-1.

FRED KLEIN
Comment 8-1: Thank you for taking the time to review the DEIS and provide your comments. Your concerns are being considered and will be reflected in the results of the final analysis which will be set forth in the Cave Gulch ROD.

See response to comment 4-2.

USA TRUCKING
Comment 9-1: See response to comment 6-1.

ROY H. GUESS
Comment 10-1: Section 303 of the Federal Land Policy and Management Act of 1976 authorizes criminal enforcement of regulations adopted by the Secretary of the Interior through BLM under FLPMA relating to the management, use, and protection of the public lands and the property located thereon. 43 U.S.C. 1733. FLPMA provides for criminal penalties in the amount of $1,000.00 or imprisonment of no more than 12 months, or both, for violations of the Act. United States Magistrates, United States District Judges, and juries consisting of citizens of the United States, are utilized during criminal legal proceedings.

REP. CHARLES P. "PAT" CHILDERS
Comment 11-1: In response to the proposed Natrona County agreement for cooperating agency status on the EIS, the BLM responded in a letter dated Dec. 10, 1996, that BLM wished to cooperate and coordinate with Natrona County but that some of the items in the draft agreement were not appropriate and were not "within the letter of the law."

The Council of Environmental quality regulations and the Bureau of Land Management planning regulations have no provisions for exclusive or separate involvement by the County or any other party to review and provide comment on a Federal National Environmental Policy Act planning document. The planning regulations are very explicit in allowing other Federal agencies, State and local Governments, and Indian Tribes the "same" times and time periods for review/comment on NEPA/planning documents as provided for all other publics.

This certainly does not mean that the County Government has no way to affect resource and land use decision making on Federal lands. It also does not mean that there is no way for County Government and Federal agencies to cooperate and work together in the course of a planning effort or preparing a NEPA document on either a Federal or non-federal project. In fact, we wish to work very closely with Natrona County.
RESPONSE TO COMMENTS

As set forth in the DEIS on page 4-57: Nesting Related Impacts. When oil or human activities occur within the zone of influence of active raptor nests during the breeding/nesting season, stress from increased human activity and increased noise levels may result in nest abandonment, lowered productivity levels, or abandonment of the entire area. Potential effects that human disturbance can have on nesting raptors include nest desertion, damage to eggs or young caused by frightened adults, overexposure of eggs or young to heat or cold, missed feedings, premature fledging of young, and possible increased predation (Fyle and Olendorff 1976). The nest construction and egg laying phases in Butte nesting cycles are considered to be very sensitive times for disturbance. Later in the nesting cycle, however, tolerance to humans is much greater (Call 1978). The potential for these impacts would be greatest during the construction phase (first 10 years) when human activity levels are highest, and would generally decrease during production (10 to 40 years).

Although the disturbance potential is reduced during the production phase, some raptors may be affected at this time. This may hold particularly true for ferruginous hawks which are more sensitive to human disturbances and abandon their nests more readily than any other Butte species (Howard 1975, Smith and Murphy 1967, Powers et al 1975, Olendorff 1973).

One effective way to mitigate potential impacts of the proposed project on raptors is to employ spatial and temporal buffer zones. Buffers around active raptor nests provide insulation from facilities, human activity, and altered habitat. In Wyoming, buffer zones have been commonly used by the BLM to protect raptor nests near surface mines and oil and gas development during the breeding season. Existing BLM RMP seasonal raptor stipulations specify a 1/2- to 1/5-mile buffer zone around all active raptor nests during the nesting period. Buffer size and dates may vary, however, as determined by the BLM Authorized Officer (AO), depending on the status of current use, species involved, and the arrangement and size of natural topographic barriers.

The BLM, WRMG's April 1996 report (referenced in the DEIS) specifies the factors considered by the BLM to conclude that the Key Raptor Area has low potential for oil and gas development in the foreseeable future. Published geological data used in preparation of the report included the results of a seismic line across the proposed KRA: a report that identified a northeast-southwest trending strike-slip fault or shear zone in the proposed KRA. and, a published map identifying a northeast trending synclinal axis across the middle of the proposed KRA parallel to the seismic line. The strike-slip fault or shear zone is likely to exclude the proposed KRA geologically from the Cave Gulch-Bullfrog-Waltman project area. Considering the location of synclinal axis, there is no structural "trap" where oil or gas could accumulate in the proposed KRA. None of the eight wells drilled in the proposed KRA since the 1930s have ever produced oil or gas, and only one of the eight wells showed any initial production potential (6 barrels of oil per day). The projected future development of fewer than 15 wells is typical of "low" development in an area the size of the proposed KRA.

RICHARDSON TRUCKING

Comment 13-1: See response to comment 6-1.

TOTEM CONSTRUCTION CO., INC.

Comment 14-1: See response to Comment 12-1.
Additionally, the abandonment of a ferruginous hawk nesting attempts on the EIS Project Area declined, the intensity of red-tailed hawk nesting attempts increased. As shown in Table 3, the number of occupied red-tailed hawk nests on the project area (0.025 per square mile) was more than double that on the surrounding 233 square miles (0.009 per square mile). The implications of these survey results are that:

- region-wide nesting activity and success were higher in 1996 than in 1994 and 1995.
- as region-wide nesting activity increased the nesting success of sensitive species such as the ferruginous hawk was lower on the EIS Project Area (zero) than it was on the surrounding area (0.03), while the success of less sensitive species such as the red-tailed hawk was higher on the EIS Project Area than it was on the surrounding 233 square miles (Table 3).

Although 1996 was the first year raptor prey base surveys were conducted, and no between-year comparisons can be made, it appears from field assessment that prey populations have increased between 1994 and 1996 and this is the most likely factor contributing to the increase in raptor nesting attempts in the area. It may be that prey populations are on the rise and that subsequent years will show a commensurate increase in successful raptor nesting attempts.

Commensurate with the apparent rise in prey base populations, well field development on the project area has increased and, for the first time in 3 years, appears to be displacing the more sensitive raptor species, such as the ferruginous hawk, and allowing the encroachment of less sensitive species such as the red-tailed hawk. Only more observations in future years can confirm or reject these initial and tentative conclusions.

Additionally, the abandonment of a red-tailed hawk nest occurred during 1995 as the direct result of surveys operating in the immediate vicinity.

There is no stipulation to limit operations due to weather. During the past 3 years since the Cave Gulch discovery well, the actual limitations due to weather have been minimal. Please also refer to Comments 12-1.

Comment 19-2: Raptors already reside in the proposed KRA and have been present there for a long time. The setting aside of this acreage would, as described on page 4-68 of the DEIS, serve as a long-term nucleus that will help to protect and stabilize the on-going production of raptors in the greater area and region and help to minimize cumulative impacts.

Comment 19-3: See response to comments 4-2 and 6-1.

HOWARD L. EWART

Comment 20-1: Criteria to determine significance of impacts to raptors is described at page 4-53 of the Draft EIS. The kinds of nesting related impacts are described at page 4-57, and an assessment of impacts relative to the significance criteria is given for each alternative at pages 4-58 through 4-71. See Table 4-18 for a summary. Cumulative Impacts are described in Chapter 5 at pages 5-20 through 5-27.

The analysis documented in the DEIS predicts that significant impacts to visual quality and recreation resources would occur under any of the alternatives analyzed. No new information has been provided as a result of public review and comment on the draft EIS which would warrant changing the impact conclusions in the Final EIS. A Finding of No Significant Impact (FONSI) can only be issued when the analysis predicts that impacts are not expected to be significant. Therefore, the BLM can not declare the project a FONSI.

Please also refer to response to comments 12-1, 43-27, and 45-3.

SOUTHWEST WYOMING MINERAL ASSOCIATION

Comment 21-1: Management guidelines were proposed for each kind of activity that might occur in the proposed KRA. Different kinds of restrictions were proposed according to the level of human activity, use of mechanized equipment, duration of activities, and whether short-term and/or long-term changes to the land were predicted.

Potential impacts to raptors are described at page 4-57 through 4-59

Please refer to response to comments 12-1, 19-1, 43-1, 43-27, 45-3, 45-16, and 51-18

ABB VETCO GRAY

Comment 22-1: See response to comment 6-1.

LAVETA PENNOCK

Comment 23-1: Please refer to response to comment 19-1, 43-27, and 45-3.

DAVE ORNDORFF

Comment 24-1: Thank you for your comment. "Multiple use" also includes the use of some land for less than all of the resources (Sec. 103 (c) of FLPMA); and management based upon the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output (also Sec. 103 (c) of FLPMA).

Through multiple use management, Alternative B emphasizes priority of oil and gas development in the project area and priority of raptor nesting habitat in the proposed Key Raptor Area.

Comment 24-2: Ferruginous hawks, one of the principal raptor species that is likely to be displaced from much of the project area, prey on rodents and small rabbits and are too small to prey on livestock.

See also responses to Comment Nos. 12-1, 19-2, and 25-1.
RESPONSE TO COMMENTS

Comment 24-3: The Federal Minerals Management Service is responsible for collection and disbursement of federal mineral royalties. The Wyoming Department of Revenue is responsible for the collection of State mineral severance taxes, sales and use taxes. The Wyoming State Land and Investment Department is responsible for the collection of State mineral royalties. Natrona County is responsible for the collection of ad valorem taxes on production and facilities.

CHARLES J. SPURLOCK

Comment 25-1: Existing federal and state laws, as well as BLM policy and stipulations, require that land managers take certain measures to protect wildlife regardless of their numbers. In some cases, the species of wildlife that exhibit the lowest population densities are the very species that require the most protection, e.g. Threatened and Endangered Species. Field data collected during 1996 indicate that the low density of raptor species on the Project Area and surrounding areas is probably due to the temporary low density of prey species. Populations of prey species tend to cycle, causing populations of the raptor species that depend upon them to cycle in turn. Therefore, higher densities of both prey and raptor populations are likely to occur in the future when the prey cycle returns to its high.

Please refer to responses 12-1, 19-1, 19-2, 24-1, 43-27, and 45-3.

NINA EWART

Comment 26-1: Please refer to responses 12-1 and 20-1.

DR. MAYO W. CALL, RAPTOR ECOLOGIST

Comment 27-1: Thank you for your authoritative comments and suggestions. The perspectives you provided are being considered. Results of the final analysis will be set forth in the Cave Gulch ROD.

DEPARTMENT OF THE ARMY

Comment 28-1: Thank you for your comment.

WILLARD FRANK

Comment 29-1: Thank you for your comment. Please refer to responses 12-1, 19-1, 25-1, 43-27, and 45-3.

RALPH MYERS

Comment 30-1: BLM’s policy for applying a seasonal restriction stipulation for raptors on an oil and gas lease offer is given at page 1-13 of the Draft EIS. Application of this restriction to specific actions, such as drilling and construction, is done under the PRRA Resources Management Plan Decision WIL7: Raptors (page 30 of the PRRA RMP ROD).

BLM’s policy is to apply the seasonal restriction to “active nests” as defined in our land use plan (see Errata). Primarily, the seasonal restriction is applied to avoid the disturbance of nesting raptors. Thus it prevents violation of the federal laws and state statutes which protect raptors and their nests.

After the Barrett field development environmental assessment (EA) was completed, numerous changes from the analyzed proposed action were proposed. As a result, implementation of raptor mitigation, upon which a Finding Of No Significant Impact (FONSI) for the EA relied, could not be achieved. Subsequently, the Chevron EA proposed action was changed repeatedly over several months. Without a clearly defined proposal to assess, the BLM could not predict the potential impacts sufficiently to determine if there could be a FONSI. The Draft EIS found that the impacts of an undefined proposed action could not be quantified or predicted.

Please refer to responses to Comments 12-1, 19-1, 43-27, and 45-3.

ROBERT STANLEY LOWE

Comment 31-1: Figure 5-2 of the Draft EIS shows the importance of the Project Area in having 52 nests in 40 square miles of the total 170 nests in the GRAA in 273 square miles (Draft EIS pages 5-20 through 5-22). Likewise, the proposed KRA has 24 nests in 9.7 square miles (Draft EIS page 4-67).

For 1996, the density of occupied nests was also greater for the project area and the proposed KRA than for the remainder of the GRAA (Draft EIS pages 5-22 through 5-29).

Please refer to responses to Comments 12-1, 19-1, 25-1, 30-1, 43-27, and 45-3.

Comment 31-2: Thank you for your comment. Please refer to response 11-1.

Comment 31-3: Please refer to response to comment 12-1, 19-1, 24-1, 25-1, 30-1, 43-27, and 45-3.

Comment 31-4: Please refer to response 11-1.

Comment 31-5: Please refer to response 30-1.

Comment 31-6: Please refer to responses 12-1 and 24-1 for more information.

Comment 31-7: Thank you for your comment.

DRU BOWER

Comment 32-1: Thank you for your comment.

Comment 32-2: The BLM was unable to locate a 1992 U. S. Bureau of Mines Availability of Known Mineral Deposit Areas (KMDAs) for Oil & Gas in Wyoming report or map. With the assistance of the Petroleum Association of Wyoming, a U. S. Bureau of Mines report entitled, "Availability of Federally Owned Minerals for Exploration and Development in Western States: Wyoming, 1990"
RESPONSE TO COMMENTS

was found. This report is a regional look at mineral potential, and Plate 3 (map entitled, "Availability of Federal Mineral Land Compared with Known Mineral Deposit Areas for Oil and Gas in Wyoming") includes the project area and adjacent proposed KRA in moderate to high value areas. The Cave Gulch-Bullfrog-Waltman project area and the proposed KRA are within the northeastern Wind River Basin, which is generally an area of high mineral potential. The 1990 report states, "Much of the area assigned to high- and moderate-value KMDAs (known mineral deposit areas) does not contain valuable mineral deposits; conversely, valuable deposits may occur outside these areas." The 1996 BLM report is specific to the proposed KRA, and provides the analysis performed by the BLM to conclude that the mineral potential of the proposed KRA is distinct from the general findings for the Wind River Basin.

Please refer to response 12-1 for more information.

Comment 32-3:

As a result of public comment, additional information on the opportunities to secure ANS sites on mixed-ownership were offered. The opportunities and the information will be taken into consideration in the selection of sites and addressed in the Record of Decision.

Comment 32-4: Please refer to response to comment 12-1.

Comment 32-5: In the cases of seasonal restrictions, there was a misunderstanding that the entire natural gas development would cease for six months. That information was incorrect, and the implementation and effects of seasonal restrictions have been clarified in the FEIS errata.

Please refer to responses to Comments 6-1, 12-1, and 25-1.

ROBERT STELLMAN

Comment 33-1: Please refer to responses to Comments 12-1, 24-1, 25-1 and 31-1.

ROBERT YONTS

Comment 34-1: A good suggestion that has been incorporated into the selection process for suitable sites for ANSs. In some areas, however, it may not be feasible to use dry hole marker sites because of new seismic data that indicates product potential at levels deeper than was tested by the dry hole wells.

Comment 34-2: Thank you for your comment. Please refer to response 12-1 and 32-2 for more information.

Comment 34-3: We agree with your assessments and have described these same points in the Cumulative Impact Analysis in the Draft EIS at pages 5-26 through 5-27.

Please refer to response to Comment 12-1.

DOUG SAMUELSON

Comment 35-1: The use of ANSs to mitigate potential impacts to raptors on the project area, as described on pages 4-60 and 4-61, is being considered and a final decision and/or plan will be presented in the ROD.

The BLM considers the social economic impacts of a proposed action. In the cases of seasonal restrictions, there was a misunderstanding that the entire natural gas development would cease for six months. That information was incorrect.

Please refer to responses 12-1, 24-1, 25-1, and 30-1.

MURIE AUDUBON SOCIETY

Comment 36-1: Thank you for your comment.

REPRESENTATIVE CAROLYN PASENEAUX

Comment 37-1: See response to comment 4-2.

Comment 37-2: Please refer to response 11-1.

Comment 37-3: Please refer to responses to Comments 12-1, 19-1, 19-2, and 25-1.

Comment 37-4: See response to comments 6-1, 12-1, 24-1, and 25-1.

Comment 37-5: Social and economic objectives were given sufficient consideration for management to make a decision.

Comment 37-6: Thank you for your comment. Please refer to responses 11-1, 12-1, and 19-2.

U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION VIII

Comment 38-1: Implementation of the proposed action, particularly as specified in the Water Resources Impacts (section 4.4.3.1) and Water Resources Mitigation Summary (section 4.4.5) is designed to protect all useable groundwater, regardless of regional significance. Specifically, by complying with Onshore Oil and Gas Order No. 2, "proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all useable water zones . . . ."

The Environmental Protection Agency, under the provisions of Section 1425 of the Safe Drinking Water Act, has delegated the WOGCC authority to administer the Underground Injection Control Program for Class II injection wells on federal, state, and private lands in Wyoming. The BLM recognizes the Commission's authority, and accepts their approval of Class II injection wells, as specified in a Memorandum of Understanding between the BLM and the WOGCC. Other classes of injection wells have been delegated to the DEQ, Water Quality Division.

Section 4.4.3.1 requires pit liners to have a permeability of less than 0.0000001 cm/sec. Also see specifications in 43 CFR, Part 3160. III Requirements. E. Design requirements for pits, Figure 2.
RESPONSE TO COMMENTS

Example Of Acceptable Design For Concrete, Asphalt and Bentonite/Clay Liners. If the Operators proposed to use liners of materials other than poly membranes, they would be required to meet and certify the specifications as listed, which could include a monitoring program for each pit with a leakage detection system and/or monitor wells.

Evaporation pits authorized by the BLM for the disposal of produced water would be designed in accordance with the requirements of Onshore Order No. 7. Pits would be lined with material that is impervious and resistant to weather, sunlight, hydrocarbons, aqueous acids, alkalies, salt, fungi, or other substances likely to be contained in produced water. In addition, they would have an underlying gravel-filled sump and lateral system or other suitable device for the detection of leaks which would be inspected at least once a month.

The Final EIS is not a decision document. Its purpose is to inform the public of the impacts associated with implementing the Proposed Action and to evaluate alternatives to the proposal. Included as part of the analysis is identification of mitigation measures intended to avoid or reduce predicted impacts. As with the Draft EIS, the Final EIS is issued for public review and comment. Following the comment period, the BLM will consider the information and comments received and a decision will be reached. The decision regarding the project will be documented in a Record of Decision (ROD) signed by the Bureau of Land Management (BLM) State Director, Cheyenne, Wyoming. The ROD will define the decision; specify the administrative requirements and conditions of approval (e.g., mitigation and monitoring measures); and, explain the rationale for the decision.

Comment 38-2: Section 3.2.1. Climate, Precipitation, and Winds
1. The wind speed classes are reported in knots (one knot equals nearly 1.15 statute miles per hour). This correction is included in the FEIS Section 2 - Addendum and Errata.

2. Additional material and reference are included in the FEIS Section 2 - Addendum and Errata.

Section 3.2.2. Air Quality
1. The Cumulative Impact Study Area was presented as Figure 1.1 (Page 1-2) of the "DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis" (TRC 1997a), and was incorporated by reference into the DEIS.

2. The Wyoming Ambient Air Quality Standards (WAQAS) and the National Ambient Air Quality Standards (NAAQS) were reported by WDEQ (1995) and WESTAR (1995). Gaseous pollutant standards were converted to mass per volume units assuming standard temperature and pressure conditions. These references for Section 3.2.2 and Table 3-4 are included in the FEIS Section 2 - Addendum and Errata.

3. The third column of Table 3-4 should be titled "Background Concentration (μg/m³)." A revised Table 3-4 is included in the FEIS Section 2 - Addendum and Errata.

RESPONSE TO COMMENTS

4. A revised Table 3-4 is included in the FEIS Section 2 - Addendum and Errata.
The 90th percentile maximum 1-hour ozone value measured at Pinedale, Wyoming was assumed to be representative of the Cave Gulch - Bullfrog - Waltman Project Area, and reflects allowable expected number of ozone standard exceedances. For further information regarding the ozone standard and its interpretation, the commenter should review 40 CFR 50.1 and 40 CFR 50, Appendix H, respectively.

Section 4.2.1. Introduction
The sentence has been revised and is included in the FEIS Section 2 - Addendum and Errata.

Section 4.2.2. Impact Significance Criteria
The sentence and Table 3-4 have been revised and are included in the FEIS Section 2 - Addendum and Errata Section 4.2.3.

Section 4.2.3. Direct and Indirect Impacts
1. The paragraph has been revised and is included in the FEIS Section 2 - Addendum and Errata.

2. As stated in the DEIS, ozone is formed as a result of photochemical reactions involving ambient concentrations of volatile organic compounds and oxides of nitrogen. The predicted impact is based on a nomograph developed using meteorological conditions (i.e.; sunlight, temperature, stagnation, etc.) more conducive for forming ozone than would be found in southwestern Wyoming. Therefore, the total predicted ozone impacts are likely to overestimate actual expected concentrations because they reflect the sum of the maximum representative background and modeled ozone concentrations. The 90th percentile maximum 1-hour ozone value measured at Pinedale, Wyoming was assumed to be representative of the Cave Gulch - Bullfrog - Waltman Project Area, and reflects allowable expected number of ozone standard exceedances. Assuming a greater background ozone concentration would increase the total predicted impact proportionately, but is not appropriate for this analysis.

3. The sentence has been revised and is included in the FEIS Section 2 - Addendum and Errata.

4. The sentence has been revised and is included, along with the reference, in the FEIS Section 2 - Addendum and Errata.

5. The phrase has been revised and is included in the FEIS Section 2 - Addendum and Errata.

6. Please see response to Comment 38-2 (Section 3.2.2, Air Quality, Number 1).
RESPONSE TO COMMENTS

7. As stated in the 'DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document Cumulative Air Quality Impact Analysis' (TRC 1997a), page A-2:14: "Triethylene glycol (TEG) is used to remove the water from the field gas by bubbling the inlet gas through TEG in a packed tower. The rich glycol (containing water) exits the bottom of the tower and flow to the regenerator, while the dehydrated gas exits the top. Triethylene glycol has a higher boiling point than water, thus the glycol water bond is broken by heating the rich glycol past the boiling point of TEG, but below the lean glycol point of TEG. The lean glycol from the regenerator is routed back to the contact tower for reuse." No triethylene glycol would be emitted from dehydrators.

8. As in the 'DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis' (TRC 1997a), page 5-9: "The WDEQ does not have any defined exposure levels for the HAPs. n-hexane, benzene, toluene, ethyl benzene, xylene, or formaldehyde. Screening values for short- or acute exposure limits were determined from a review of various States' Acceptable Ambient Concentration Levels (AACLs) that were available from the National Air Toxics Information Clearinghouse (EPA 1997)." The lower range value for benzene (30 g/m³) came from the State of Florida, Pinellas County Air Pollution Control Board, not the State of Texas.

9. Please see response to Comment 38-2 (Section 4.2.3, Direct and Indirect Impacts, Number 8).

11. As stated in the 'DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis' (TRC 1997a), page 5-9: "The ISCST3 model was used to simulate the transport and dispersion of n-hexane and BTEX HAPs from a representative "worst case" patch or group of eight simultaneously producing well sites, all emitting a maximum possible 50 tons per year of VOCs..." and on Page 2-5: "Maximum gas processing emissions would be those from a well at 50 tons per year of VOCs. The WDEQ requires Best Available Control Technology (BACT) for emissions greater than 50 tons per year of VOCs. No specific control measures were identified."

As stated in Section 4.2.1 (Introduction) of the DEIS, page 4-7: "The WDEQ/AGD is responsible for implementing and enforcing Federal and State air quality laws, regulations and standards. Under FLPMA and the Clean Air Act, the Bureau of Land Management can not conduct or authorize any activity which does not conform to all applicable local, state or Federal air quality regulations, standards or implementation plans." Therefore, the air quality impact analysis assumed VOC, and therefore HAP) control measures required by the WDEQ/AGD would be implemented, and additional mitigation measures would not be necessary.

2. As stated in the 'DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis' (TRC 1997a), page 5-12: "For the purposes of this assessment, the estimated cancer risks were evaluated in the context of a target cancer risk level of one in a million (i.e., 1e-06). Under the "Superfund" National

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Oil and Hazardous Substances Pollution Contingency Plan (EPA 1990a), a cancer risk range of 1e-06 to 1e-04 is generally acceptable, while risks above 1e-04 typically imply a need for remediation. A cancer risk of 1e-06 is considered the point of departure for determining risk-based remediation goals."

13. As stated in Section 2.5 (Alternative C - No Action) of the DEIS, page 2-43: "For this project, the No Action Alternative is denial of the drilling and development proposal as submitted by the Operators. However, the Department of the Interior’s authority to implement a "No Action" alternative would deny the proposal as submitted but would allow consideration of individual APDs on federal lands on a case by case basis through individual project and site-specific environmental analysis. Therefore, the statement in the first paragraph on page 4-11 is consistent with Section 2.5 of the DEIS.

14. Potential emission levels would meet Prevention of Significant Deterioration (PSD) Class II increment levels (no PSD Class I areas are likely to be affected by the proposed project). The maximum modeled NOx concentration of 22.3 is below the applicable PSD Class II increment of 25 μg/m³. This comparison is not a comprehensive PSD Increment Consumption analysis (which is a regulatory inventory and compliance responsibility of the state regulatory agencies and the EPA), but is included to indicate the potential level of significance.

This additional material is included in the FEIS Section 2 - Addendum and Errata.

Section 4.2.5. Mitigation Summary

The air quality impact analysis assumed those NOx and VOC control measures required by the WDEQ/AGD would be implemented, and additional mitigation measures would not be necessary.

Comment 38-3. The Record of Decision for the Platte River Resource Area Resource Management Plan, dated July 1985, did not identify any acreage in the project area that would require a "No Surface Occupancy" stipulation. Therefore, there are no leases in the project area with a "No Surface Occupancy" stipulation.

The COE is ultimately responsible for determining what areas are waters of the U.S., including special aquatic sites and jurisdictional wetlands. Based on several years of coordination with the Cheyenne COE Regulatory Field Office, a swale that is vegetated by native upland species under normal circumstances and that does not exhibit hydric soils or wetland hydrology is not considered a watershed of the U.S. (see Section 3.5.2, page 3-42). Impoundment on such swales for agricultural (i.e., livestock watering) and aesthetic purposes exempt such areas as waters of the U.S. Use of such an impoundment does not make such areas jurisdictional, however, use of such areas by waterfowl, etc. may provide regulatory authority under the Fish and Wildlife Coordination Act. Further, this section clearly states that ephemeral channels that are at bed and grade and that show consistent fluviogeomorphic development process are waters of the U.S., even though flowing water may be absent for most of the year.

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Should a watershed management plan, as identified in Section 4.3.2, be required by the BLM, the WDEQ and other appropriate state, federal, and local agencies would be involved.

Section 4.5.2 (bullet #6) correctly identifies EO 11988 as the "floodplain protection" EO and 19990 as the "wetlands protection" EO. However, Section 4.4.1 inadvertently switched these two EO's. The correction has been made in the Errata.

BLM and other agency authorization of the proposed project would require compliance with Pollution Prevention Act of 1990, EO on Pollution Prevention in 1993 (EO 12856); Spill Prevention Control Plan, Clean Water Act, CEQ guidelines, and NEPA.

Soil and reclamation information was presented in the DEIS at Sections 2.2.2.2 (page 2-17), 4.3.3.1 (page 4-18), 4.3.5, bullet #2 (page 4-29), Section 4.4.5, bullet #1 (page 4-40), and in Appendix B.

In general, construction during the no flow period is preferable to during the low flow period. However, in certain circumstances as specified by the BLM, construction during the low flow period may be acceptable.

The 20 percent weed threshold has been utilized by the BLM on similar gas development projects in Wyoming. The 10 percent vegetation and wetlands threshold has been used effectively on other BLM natural gas development projects in Wyoming. It is true that waters of the U.S. including special aquatic sites and wetlands are particularly rare and therefore require special attention, and the CWI in general and Section 404(b)(1) guidelines prohibit the net loss of such areas. The final result of Section 404 permitting would be the compensatory mitigation of unavoidable adverse impacts of the least damaging practicable alternative. Assuming successful mitigation, there should be no net loss regardless of the threshold used. Further, given the environmentally conservative impact assessment, a short-term impact of 2.2 percent and a long-term impact of 1.1 percent will occur. Through avoidance, impact minimization, and compensatory mitigation, no net loss would occur regardless of the threshold used.

Refer also to response 38-1 for more information.

Comment 38-4: Onshore Oil and Gas Order No.2, as summarized in section 4.4.3 of the DEIS "proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones." This is the primary tool by which casing programs are controlled.

When processing an APD, the BLM geologist identifies the maximum depth of usable water as defined in Onshore Oil and Gas Order No. 2. Usable water is defined as that water containing 10,000 parts per million or less of total dissolved solids. Zones containing water of this quality would be isolated.

Determining the depth to freshwater requires specific water quality data in the vicinity of the proposed well or the use of logs from nearby wells. The surface casing setting depth varies from hole to hole depending on the geological stratigraphy of usable water bearing horizons. If freshwater is identified, surface casing is required to be set below the deepest freshwater zones found. If usable water is found at a depth that is too deep to set surface casing, the operator is required to isolate those zones. Figure 2-11 represents a typical completion schematic. Note that formation, casing, and cement depths will vary depending on the well location stratigraphy.

The potential locations of springs and seeps are provided (as stated) on Figure 3-6 in section 3.5, Vegetation and Wetlands.

Please refer to responses to comments 38-1 and 38-3 for additional information.

Comment 38-5: The complete avoidance of most selected raptor nesting areas would be accomplished under Alternative A. BLM is factoring all comments and the merits and disadvantages of the Proposed Action and each of the alternatives into the decision process which will be set forth in the ROD.

The biological value of ANSs is given in the Draft EIS at pages 4-60 and 4-61. The biological value of the proposed KRA is given in the Draft EIS at page 4-68. It contributes to mitigation on the cumulative area (the GGRA basis).

A raptor monitoring and mitigation plan is being developed and will be addressed in the ROD.

Please refer to responses to Comments 19-2 and 25-1.

TRINITY PETROLEUM EXPLORATION, INC.

Comment 39-1: See response to comment 6-1.

Comment 39-2: Designation of a proposed KRA would not constitute a "taking" of oil and gas lease rights. The existing oil and gas leases would remain available for exploration and development subject to standard lease stipulations and the land use decisions specified in the RMP with provisions for further Area Leases should field development be proposed. There is no taking involved if future oil and gas leases are offered subject to no surface occupancy stipulations, or if lands are not offered for oil and gas leasing.

Please also refer to response 12-1 for more information.

Comment 39-3: Thank you for your comment. See responses 12-1 and 24-1.

PHILLIPS PETROLEUM COMPANY

Comment 40-1: Public support in Natrona County for development of the natural gas resources in the project area has been substantial during the scoping period and the public comment period on the DEIS.

Comment 40-2: Thank you for your comment.

Sufficient flexibility is available in the DEIS to address the reasonably foreseeable development that might be necessary to fully recover the estimated gas reserves in the project area. The DEIS states that the "precise number of additional wells" would be directed by the success of development drilling and production technology, and economic considerations such as the cost of
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development of leases within the project area with marginal profitability.” Further, the Proposed Action described by some of the lease operators was “…based on reasonably foreseeable and drilling projections into areas within the project area…” and is "a maximum development scenario …… that attempts to provide for maximum recovery of the natural gas resource" (DEIS sections 2.0 and 2.1).

Comment 40-3: Potential impacts to raptors are described at page 4-57. Table 4-18 shows the number of pairs which are predicted to be displaced under each alternative, either without ANSs or with ANSs. Based upon the Significance Criteria at page 4-53, the displacement of raptor pairs (without ANSs) would be significant. However, these are only potential impacts because ANSs are identified as mitigation under each alternative.

Please refer to responses to Comments 12-1 and 30-1.

Comment 40-4: Refer to response 11-1.

Comment 40-5: The BLM realizes the importance of allowing lease holders to protect their leases from drainage that may result from development on adjacent leases. The schedule and sequence of lease development within the Cave Gulch-Bullfrog-Walman project area was not specified in the alternatives analyzed. This allows maximum development flexibility for individual unit and lease operators, and should facilitate development to prevent drainage from adjacent lease development.

CITY OF CASPER, CASPER CITY COUNCIL

Comment 41-1: Please refer to responses to comments 12-1, 19-1, 19-2, 24-1, 25-1 and 30-1.

WYOMING OUTDOOR COUNCIL

Comment 42-1: The BLM appreciates the involvement of the Wyoming Outdoor Council (WOC) in the planning of natural gas development in the Cave Gulch-Bullfrog-Walman project area, especially as a participant in the Cave Gulch-Bullfrog-Walman Air Quality Impact Assessment “Stakeholder” Group. WOC (along with the WDEQ/AQD, EPA, and the USDA-Forest Service) reviewed and provided comments on the Air Quality Impact Assessment Protocol before the analysis was performed, and provided comments on the Preliminary Air Quality Impact Assessment results. Early involvement by the “stakeholders” improved the quality of the analysis.

However, the Commenter’s concerns that “oil and gas development is proceeding at a neck-breaking speed throughout the state without adequate consideration or understanding of its impacts,” and “industrialization of the Cave Gulch area will overwhelm the area’s other resources” are unfounded.

The air quality analysis was prepared under the legal requirements of the National Environmental Policy Act, in order to provide the “decision maker” a comprehensive review (and public disclosure) of potential “significant” environmental impacts prior to issuing the Record of Decision. Although applicable requirements under the Clean Air Act (and other “thresholds”) were considered when determining potential “significant” air pollution impacts, the EIS is not a regulatory document under the legal requirements of the Clean Air Act (in other words: the EIS is prepared to provide support to a land management decision, not an air quality permitting decision).

The maintenance and improvement of air quality is the responsibility of the State of Wyoming air regulatory agency (WDEQ/AQD) with EPA oversight. The operators of future natural gas facilities must obtain air pollution emission permits prior to operation, and continue to demonstrate compliance with air quality permit requirements once operations begin. Since the BLM cannot conduct or approve any activity which does not comply with all applicable air quality laws, statutes, regulations, standards or implementation plans, existing BLM authorizations are subject to revocation if State and Federal air quality requirements are violated. Through active cooperation, natural gas development can occur in Wyoming without the dire consequences the commenter presumes.

Comment 42-2: The State of Wyoming is in “in attainment” for all “criteria” air pollutants (carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide), with the exception of Sheridan County which is in “nonattainment” for particulate matter. The EPA is responsible for assuring the State of Wyoming is taking the steps necessary to attain and maintain the National Ambient Air Quality Standards through the State Implementation Plan (SIP). If the State of Wyoming fails to adequately implement the SIP, then EPA is obligated to withdraw its approval and implement it’s own plan to achieve the standards.

For the purposes of the EIS, the BLM must “succinctly describe the environment of the area(s) to be affected” (40 CFR 1502.15) including air quality, but is not required to collect on-site data in order to conduct the analysis if “credible scientific evidence which is relevant to evaluating reasonably foreseeable impacts” (40 CFR 1502.22) is available. The BLM determined the background air quality data reported in the DEIS Section 3.2.2 (Air Quality) are adequate to describe the Affected Environment in the Cave Gulch-Bullfrog-Walman project area.

The Commenter’s suggestion to establish an EPA-sanctioned monitoring station in the Cave Gulch to obtain accurate background air quality data should be addressed to the appropriate air regulatory agencies (WDEQ/AQD and EPA).

Comment 42-3: EIS Figure 1-1 is specifically used to describe the location of the Cave Gulch-Bullfrog-Walman project area. In Appendix A (Cumulative Air Quality Impacts Analysis - Technical Support Document Addendum), Figure 1 presents the Cumulative Impacts Study Area (CISA), which identifies the project area and the locations for all sources emissions that were included in the cumulative air quality impacts analysis. Appendix A also provides a list of these sources.

Comment 42-4: Please see responses to Comment 38-2 (Section 3.2.2, Air Quality, Number 1) and comment 42-3.

The EIS analyzed potential cumulative air quality impacts for only those additional sources which are not adequately represented by the background condition (such as sources permitted but not yet operational) and have the potential to cause “cumulative” impacts for the same air pollutants with the Proposed Action and Alternatives. Since NO2 was the only air pollutant “reasonably foreseeable” to potentially interact with other emission sources which were not adequately represented by the background condition, it was not appropriate to conduct a “cumulative” analysis for the other listed pollutants.

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Comment 42-5: The USDA-Forest Service "Limit of Acceptable Change" for lake chemistry and haze visibility impacts in the Cloud Peak PSD Class II Wilderness Area were included in the DEIS Section 5.3 (Cumulative Impacts Analysis - Air Quality). As stated in Section 5.3 (Cumulative Impacts Analysis - Air Quality) of the DEIS, page 5-5: "Since emissions from the proposed, and current, would constitute many small sources spread out over a very large area, discrete, visible plumes are not likely to be created or to impact the Cloud Peak Class II Wilderness Area." 

Comment 42-6: As stated in the "DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis" (TRC 1997a), page 5-20: "Organic aerosols are also secondary particulate compounds, formed through chemical reactions in the atmosphere. At present, organic aerosol formation processes are not well understood, and current modeling techniques are not available for estimating visibility degradation due to organic aerosols (IWAQM 1993). A review was conducted to determine if sufficient data exist to quantify the effects of VOC emissions on visibility. It was concluded after this review that there were no applicable data or appropriate modeling techniques that could be used to estimate the visibility effects of such emissions. Furthermore, while VOC emission may potentially affect visibility, the methodology for quantifying these effects has not been adequately developed and tested. The important conclusions from this review are summarized as follows.

"Pandis, et al. (1992) have presented data from laboratory experiments indicating an aerosol fraction for a number of VOC compounds. For example, these data indicate the aerosol yield for toluene is 424 μg/m²/ppm. This aerosol fraction was based on laboratory chamber data using the following initial conditions: (1) hydrocarbon concentration of 0.89 ppm; (2) a background NO2 concentration of 0.20 ppm (377 μg/m³) and (3) ozone concentration of 0.355 ppm (656 μg/m³); (4) an ambient temperature of 84°F; and (5) a relative humidity of 50 percent. While these meteorological conditions could occur in central Wyoming, the background pollutant concentrations would not. Pandis also concluded that the aerosol fraction was not produced directly from the hydrocarbon emissions but from secondary gaseous products. This is consistent with the work of Pandis (1994 and 1995), suggesting that the aerosol fraction is formed through reactions with intermediate species, such as cresol and nitrocresol. Grosean also suggested that the net organic aerosol production rate was not correlated with the rate constant of the reaction of hydroxyl (OH) radicals. If this conclusion is true, then the rural setting of central Wyoming is not conducive to such photochemical reactions. Even if data existed that could be used to estimate the aerosol yield, models do not exist that can simulate the condensation/evaporation processes and plume dilution which are necessary to quantify the impacts of such aerosols." 

NEPA regulations state that "A agencies shall insulate the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements" (40 CFR 1502.24). The DEIS clearly recognized the theory of visibility impacts due to organic aerosol, investigated it's scientific basis, and determined it to be speculative and inadequate to meet the regulatory requirements of NEPA (40 CFR 1500.1b). 

Comment 42-7: As stated in the "DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis" (TRC 1997a), page 5-19: "Visibility impact assessments examine whether a "plume" from an emission source would be visible at the nearest sensitive location, and further, if the emissions from a group of sources in concert would contribute to increased regional haze (decreased visibility). Since the proposed well field emissions are many small emissions sources, uniformly spread out over a large area, discrete, visible plumes are not likely to occur, and the issue of concern is potential increased regional haze." 

The assertion that BLM should examine potential visible plumes from illegal burning is likely based upon insufficient information. In fact, even minor, intermittent burning, e.g., burning off small quantities of hydrocarbons from piles, requires prior approval from WDEQ/AQD. This approval may be granted over the telephone and documented in a communication log. Since BLM cannot conduct or approve any activity which does not comply with all applicable air quality laws, statutes, regulations, standards or implementation plans, there is no basis for the BLM to examine potential environmental impacts from illegal activities.

It is recommended that such minor burning, if observed, be documented and the WDEQ/AQD notified so it may take appropriate action.

Comment 42-8: It is unfortunate the Commentor regards the "EIS's analysis and conclusions as nothing more that hollow, baseless claims," further asserting the assumed 50 percent particulate matter control efficiency (by watering and/or other dust suppressant) is "invalid and scientifically insupportable," "unrealistic and arbitrary, and to our knowledge not being achieved in any gas field in Wyoming." 

Both the estimate of potential "fugitive" particulate matter emissions from unpaved roads (dirt and gravel) and possible control measures (with their control efficiencies) have been extensively studied, documented, and implemented by EPA and other regulatory agencies.

As stated in the "DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis" (TRC 1997a), page 2-2: "The emission rates from [construction activities] are computed in Appendix 1, using emission factors from EPA's AP-42 handbook (EPA 1995) and 'in computing particulate emissions from well pad and resource road construction, it is assumed that water and/or chemical dust suppressants would be applied in order to minimize TSP and PM10 fugitive dust emissions. The control efficiency of the watering and/or dust suppressant use is computed at 50%, as shown in Appendix 1.'" 

The BLM reviewed the scientific literature, and verified that 50 percent control is "reasonable and achievable" with both the WDEQ/AQD and the project proponents (operators). As such, it is proper to include this assumed level of air pollution control in the Proposed Action and Alternatives. Whether or not the 50 percent control measure is required in the land-use authorization will be determined in the "Record of Decision" 

The Air Quality Mitigation (Section 2.2 2.12 Project-wide Mitigation Measures - Resource-specific Mitigation - Air Quality, Page 2-30) has been revised and is included in the FEIS Section 2- Addendum and Errata. 

Finally, whether or not additional mitigation or monitoring measures are required in the land-use authorization will be determined in the "Record of Decision." 

Comment 42-9: The analysis of potential atmospheric deposition or visibility impacts was addressed in the BLM's Wyoming State Office Information Bulletin No. WY-97-055 (dated March 26, 1997), which states "Under the Clean Air Act all BLM administered land [in Wyoming] were..."
given Class II air quality classification, which allows moderated deterioration associated with moderate, well-controlled growth. The BLM will continue to manage WSAs as Class II (H-8550-1 - Interim Management Policy for Land Under Wilderness Review)." Further, "There are not Wyoming or Federal atmospheric deposition or visibility protection regulations for Class II Wilderness or WSAs. Therefore, until circumstances change, there is no requirement to model and analyze potential air quality impacts of proposed projects upon Wyoming BLM WSAs."

**Comment 42-10:** As stated in Section 4.2.4 (Analysis of Environmental Consequences - [Air Quality] Impacts Summary) of the DEIS, page 4-11: "No violations of applicable Federal or State air quality regulations or standards are expected to occur as a result of direct, indirect or cumulative project emissions (including construction and operation). The maximum potential air pollutant concentrations would occur close to and between, well locations, even with the densest assumed well spacing. That is, the maximum ground level concentrations occurred so close to each well that adding additional wells in the field would not increase the overall maximum concentration," and "In reviewing these predicted impacts it is important to understand the assumptions that have been made regarding resource development. The development of this analysis includes a great deal of uncertainty in the projection of specific plans (e.g. number of wells, equipment to be used, and specific locations) for resource development for 10 years in the future. All of these factors affect air emissions as well as predicted air quality impacts."

In addition, potential cumulative air quality impacts at the Cloud Peak Class II Wilderness Area were re-analyzed, including additional emission sources, as reported in the FEIS Section 2 - Addendum and Errata. However, even with these additional cumulative sources and given the inherent conservatism in the analysis, potential air quality impacts remain below applicable significance criteria for atmospheric deposition and would not result in any perceptible visibility impact on the cleanest days at the Cloud Peak Class II Wilderness Area.

Simply put, significant adverse (direct, indirect, and cumulative) impacts to air quality are not likely to occur from implementation of the Proposed Action or Alternatives.

**Comment 42-11:** Please see responses to Comment 42-2 and Comment 42-8.

**Comment 42-12:** Potential air quality impacts due to Hazardous Air Pollutants (HAPs) were analyzed as reported in Section 4.2.3.1 (Analysis of Environmental Consequences - Direct and Indirect Impacts - Proposed Action, Alternatives A, B, and C) of the DEIS, page 4-10 and 4-11. The potential HAPs emissions rates included formaldehyde (approximately 13.9 tons per year) from the proposed compressor station, as well as n-hexane (0.85 tons per year), benzene (0.12 tons per year), toluene (0.55 tons per year), ethyl benzene (0.12 tons per year), and xylene (0.50 tons per year) from the individual dehydrator, separator, and storage tank.

EPA defines an emission source with the potential to emit 10 ton per year of any single HAP, or 25 tons per year of all HAPs combined (aggregate), as a "major" source of hazardous air pollutants. Therefore, only the proposed compressor station qualifies as a potential "major" HAP source. Whether or not HAP monitoring is necessary would be determined during the permitting process by the appropriate air quality regulatory agency (WDEQ/AQD and EPA review).
or controlled through automatic means. Additionally, daily operator visits are necessary to perform normal maintenance of compressors and other pieces of production equipment.

Comment 42-20: The BLM's authority to establish and designate how funds will be managed, as you have recommended, is a federal budget allocation that is outside the scope of this planning document. As described on pages 4-60, 4-71, and 5-27 of the DEIS, significant impacts to raptors are not expected with the implementation of proposed mitigation. The need for a raptor mitigation fund is not, therefore, foreseen.

Comment 42-21: This recommendation is part of the raptor management plan, which will be addressed in the ROD.

Although a maximum of 7 pairs of raptors could be displaced by proposed actions, the DEIS calls for twice this number, or 14 ANSs, to be placed within the GRAA. The DEIS also calls for monitoring and maintenance of these ANSs and when or if necessary, replacement.

Impacts to prey base populations were analyzed at page 4-61 of the Draft EIS. Monitoring of prey base populations is part of the raptor management plan, which will be addressed in the ROD.

Comment 42-22: Raptor prey base surveys will be part of a raptor management plan, to be addressed in the ROD.

Comment 42-23: The BLM has made a good faith effort to obtain relevant information important to evaluate reasonably foreseeable significant adverse impacts on the human environment. In predicting impacts to raptors (and other resources present in the project area) accepted professional methodologies and practices were employed, and the analysis findings are disclosed in compliance with NEPA.


Comment 42-24: A plan for conducting mountain plover surveys is being developed and will be presented in the ROD.

Comment 42-25: Swift fox surveys were recommended in the DEIS (page 4-62) and will be conducted during the spring/summer of 1997. A decision on specific mitigation for swift fox will be based upon the results of the surveys and coordination with WGF and USFWS. The decision will be incorporated into the ROD.

No black-footed-ferret surveys are proposed because of the lack of suitable habitat for this species on the analysis area. As stated on page 4-62 of the DEIS, "No prairie dogs or prairie dog colonies were observed within the project area during the years 1994-1996 of field surveys of raptor nests and one prey base survey of rodents and lagomorphs in 1996. In addition, no black-footed ferret sightings within or proximal to the project area have been reported in the WGS, WYNN, or the records of the FWS.

Comment 42-26: Impact Significance Criteria for big game species are listed on page 4-53 of the DEIS and involve impacts to crucial habitats. Since no impacts to any designated crucial habitats will occur under the Proposed Action or any of the alternatives, no significant impacts to these species will occur. Never-the-less detailed and quantified discussions for impacts to non-cruicial big game habitats are set forth in sections 5.8.1 and 5.8.2 of the Cumulative Effects chapter in the DEIS.

The development of steps to reduce or minimize vehicle collisions with big game and poaching on the proposed project were recommended in the DEIS. The decision regarding recommended mitigation will be documented in the ROD.

See also response to Comment 42-29.

Comment 42-27: Sage grouse lek surveys were conducted during the spring of 1997. Because no leks were found on or within 2 miles of the project area and no crucial habitats were found during 3 years of field work in the project area, significant impacts to this species are not expected.

Comment 42-28: Potential impacts of noise to wildlife are addressed extensively in Section 4.14 of the DEIS. Pumpacks are the most usual type of long-term noise associated with the development of petroleum products. However, as described in the DEIS, the use of additional pumpacks on this project has not been proposed. Pumpacks have been in use for many years in the south end of the project area.

Comment 42-29: As described on page 2-34 of the DEIS, all project employees will be informed of applicable wildlife laws and be discouraged from engaging in off-site activities in the vicinity of drill and construction operations.

Comment 42-30: In consideration of your comment, Figure 1-2 of the DEIS has been revised to reflect that Natrona County Road 104, an existing northern road, and three existing southern roads have served and will continue to serve the project area as collector roads for the life of the project. The remaining existing and future roads will serve as local and resource roads. There would be marginal value in trying to predict which future resource roads would temporarily serve dry holes, or which would serve producing wells on a long-term basis, for the project area.

Information presented in the DEIS regarding road standards and classes; the Operators' proposed construction and reclamation techniques contained in Chapter 2 and Appendix A; the mitigation measures detailed in Chapters 4 and 5; and, the reclamation guidelines summarized in Appendix B, are sufficient for future transportation planning in the project area. Therefore, your recommendation that a separate transportation plan be developed has not been adopted.

The existing gravel sources are anticipated to be sufficient to supply the necessary gravel. However, if new sources of gravel were proposed for development, these associated activities would be addressed in a separate environmental document if the BLM has jurisdiction for the action. Since the BLM, the State, and Natrona County all have jurisdiction for authorizing gravel pits, the authorizing actions have been added to Section 1.6 of the DEIS. (p. 1-16, tbl 1-7)

Comment 42-31: Based on water quality data available for surface water resources in the region, paragraphs 1.2, and 3 on page 3-37, and paragraphs 1, 2, and 3 on page 3-38 adequately characterize surface water quality in the project area. Mitigation measures itemized in Sections 4.3.5, 4.4.5, and 4.5.5 include measures that will protect surface water quality.

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Project compliance with Section 404 of the CWA requires that project impacts do not cause restriction of aquatic life movements along streams and other waters of the U.S. Surveys for aquatic life are not required to achieve compliance with CWA Section 404.

See Section 3.4.2, last paragraph (page 3-38) in regard to fish occurrence in the project area. Soil samples analyzed for selenium had no detectable quantities of selenium (see Section 3.3.5, page 3-31, second paragraph). Section 4.4 describes potential impacts on surface water quality.

No known endangered, threatened, candidate or sensitive species of aquatic animals are known to be or suspected to be associated with the wetland sites on the project area.

The commenter has misinterpreted the information in Paragraph 4, page 3-37. The DEIS at this location states "No known point sources of pollution have been documented...". Oil and gas development activities that involve discharge of water (produced or otherwise) must meet the requirements of the CWA, including the NPDES permitting program. This is the case for the proposed project.

Please refer to response to comments 38-1, 38-3, and 42-16 for additional information.

Comment 42-32: See Section 2.2.2.6.2 for Operators' proposed groundwater separation program via well casing. See Section 4.4.3.1 for information on prevention of potential impacts of reserve pits and well bore leakage and groundwater contamination. The proposed project must comply with Onshore Oil and Gas Order No. 2 which requires measures be applied that minimize the opportunity for groundwater contamination through a casing and cementing program.

With proper application of the proposed action and its mitigation, the opportunity for groundwater contamination is remote. Considering this, it is difficult to support the cost and manpower required to develop and maintain a groundwater monitoring program.

The DEIS requires all pits to be lined to prevent leakage. The BLM routinely requires monitoring of effectiveness of reserve pit liners.

Onshore Order No. 7 requires operators to submit a sump notice outlining their closure plans prior to pit abandonment and reclamation. The method used must remove or isolate contaminates in such a manner that the public health, livestock, wildlife, and the environment are protected. Any land farming or land spreading would require DEQ approval. Testing of wastes and additional disposal requirements prior to closure of a pit may be required if there is reason to believe exempt exploration and production wastes have been commingled with hazardous wastes. The WOGCC has drafted guidance for developing detailed pit closure plans which are similar to the Colorado and New Mexico Oil and Gas Commission's guidance. The BLM concurs with the WOGCC guidance.

Please refer to responses to comments 38-1 and 38-4 for additional information.

Comment 42-33: The requested information was contained in the DEIS. See response to comment 2-1. EO 11988 and 19990 do not prohibit construction in these areas, rather they mandate that avoidance be implemented where feasible and where not feasible, impacts should be minimized. All project activities in waters of the U.S. must be fully coordinated with the COE.

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pursuant to CWA Section 404. See Sections 3.5, 4.4.5, 4.5.2, 4.5.3.1, and 4.5.5 of the DEIS as well as ECOTONE (1997).

See Sections 4.4.2, last bullet; 4.4.3.1, page 4-37, paragraph 1; 4.5.2, bullet #6; 4.5.3.1, page 4-45, paragraph 1, and Section 4.5.5, last bullet.

Please refer to responses to Comments 38-3 and 42-31 for additional information.

Comment 42-34: All development proposals have required disclosure of the water source along with the water haul route in the APD. This has been clarified in the errata section. The water provided by Mel's Water Service is trucked via Highway 20-26, County Road 104, and lease roads. The water supplied by the Flying A Ranch is trucked over lease roads and County Road 104.

If water is surface discharged, the Wyoming DEQ, Water Quality Division permits and administers the disposal. All appropriated water would be permitted and administered by the Wyoming State Engineer's Office.

See Section 4.4.3.1, page 4-34, paragraph 2 and 3; and, Section 4.4.3.1, page 4-36, paragraphs 3 and 4, on water disposal. As discussed in Section 4.4.3.1 (page 4-36, para. 3), as the field is developed, the associated produced water will be evaluated for disposal in a manner that complies with State water quality standards.

The DEIS discloses that produced water would either be used for drilling, project construction, and hydrostatic pipeline testing. Evaporation pits may also be used to dispose of produced water. The Operators would identify more specifically how produced water would be managed for each well in an application for disposal of produced water. Onshore Order #7 requires the application be submitted within 90 days of completion of the well.

For information on water rights, see Section 4.4.3.1, page 4-36, paragraphs 2 and 3.

Please refer to response to Comment 38-1 for additional information.

Comment 42-35: Activities, such as recreational use of off road vehicles, usually do not require formal authorization and would only be restricted if there were documented disturbances to raptors or adverse impacts to soil, water or vegetation resources from such activities.

Please refer to the responses to comments 38-1 and 38-3.

Comment 42-36: The 20 percent weed threshold has been utilized by the BLM on similar gas development projects in Wyoming. Therefore, your recommendation has not been incorporated.

The seed mixes presented in Appendix B are recommended since the final set of species in the mix depend on availability and cost which are variable over time. Further, the BLM would allow the Operators to modify the recommended seed mixes to adjust for lack of availability and/or excessive cost just as long as the objectives and performance standards of reclamation are met.

Please refer to the responses to comments 38-1 and 38-3.
RESPONSE TO COMMENTS

Comment 42-37: Thus far, cultural resources that would suggest that consultation with the tribes would be necessary have not been recorded (see errata p. 3-75). However, efforts are ongoing to ensure communication with Native Americans. In addition to sending them EIS notices and copies of the documents, notice of the opportunity to review and comment were sent by certified letter.

All areas that have been proposed as specific drilling locations or that have already been disturbed by well locations, oil field facilities, roads, pipelines and powerlines have been inventoried. Between 10 and 40 acres have been examined for well locations and other areal disturbances. For linear installations, a minimum 100-foot wide corridor is the standard inventory area. All sites eligible for nomination to the National Register have been avoided by all existing road, pipeline and well location construction.

As discussed on DEIS page 5-28, one aspect of continuing or future exploration in the study area is that of beneficial cumulative impacts. On-going development with concomitant pre-construction inventories will increase survey coverage and thus provide additional cultural resources information. This will enhance our understanding of prehistoric and historic land use patterns and help enable us to delineate areas of higher or lower sensitivity. Moreover, the additional data will help clarify the cultural chronology for this region, allow for comparisons with adjacent areas (South Bighorns, Rattlesnake Mountains, and the transitions to the major drainage basins to the east and west) and increase our knowledge of cultural processes in the area.

A mitigation measure identified in the DEIS (page 4-82, para 2) is cultural resource value awareness training for the area operators. The standard cultural resource stipulation attached to all APDs and rights-of-way accomplishes some of this already.

Cultural resource work in the Cave Gulch-Bullfrog-Waltman Project Area has been, and will continue to be a dynamic process in response to the needs of the operators. A comprehensive inventory has been conducted. While such an inventory is an invaluable tool in planning, the spatial distribution of cultural resources is such that project-by-project inventory does not preclude adequate protection of significant properties. All surface disturbing actions to date have been inventoried, documented, and consulted upon with SHPO. All future actions will go through the same process.

Comment 42-39: Paleontological resources are not damaged or destroyed by discovery unless such discovery results from an action that physically harms the specimen or its context. Discovery may, in fact, be a beneficial result if previously unknown resources are found. Surveys of paleontological literature and museum records, along with field surveys, are performed in order to identify areas for avoidance prior to surface disturbance. If these areas must be impacted during construction, sampling, salvage, or other mitigation methods are employed and the resulting specimens and data curated into a repository (BLM Instruction Memorandum 96-67, attachment 1-7).

Comment 42-39: Please refer to response 38-1.

Comment 42-40: The EIS analysis area was defined using geologic and reservoir analysis, consideration of the reasonably foreseeable future development likely to occur and the extent of...
RESPONSE TO COMMENTS

In the DEIS and FEIS, the BLM has attempted to minimize the accumulation of extraneous background data, in favor of emphasizing the real environmental issues. The EIS is intended to be analytic, and as such, discusses in greater detail the potentially significant issues, while more briefly discussing other issues. The intent is to emphasize the portions useful to decision makers and the public, and to reduce emphasis on background material.

Comment 42-43: Your recommendation that the FEIS include a map showing all the oil and gas leases in the project area, and a list of the stipulations for each lease, has not been implemented. The resource management prescriptions and land use decisions specified in Chapter 1, Section 1.5, are applied as-described in that section, and adding a map or list to the FEIS would not change the findings of the analysis.

When an active raptor nest is within ¼ to ½ mile of a proposed well site under the proposed action, construction would be restricted during the critical nesting season for that species. There are currently 17 nests in the project area which could affect 28 of the 107 proposed well locations.

As shown on Figure 2-12 and discussed on page 4-64, the proposed 1-mile restriction for ferruginous hawk nests under Alternative A could affect 67 of the 99 proposed well locations.

Development proposed within ¼ to ½ mile of an occupied nest would be subject to a seasonal restriction under Alternative B. It is difficult to predict the number of wells that would be affected since it is dependent upon whether birds actually occupy a nest.

The FEIS has been modified to clarify that alternative liquid processing plant locations were considered, but were not analyzed in detail.

Please refer to responses for comment 38-3 and 42-40 for additional information.

J.A. ROHN CONSULTING

Comment 43-1: The CEO regulations and the BLM regulations have no provisions for exclusive or separate involvement by one party over another to review and provide comment on a Federal NEPA/planning document. The BLM is responsible for developing alternatives to the proposed action based on public comment and input. The operators were granted the same opportunity as other members of the public to submit information for consideration.

Page S-2, paragraph 1, has been revised in the errata to address your comment that the operators did not rely on the WRMG report. Large scale versions of maps included in the DEIS were relied upon in the analysis. From a practical standpoint, smaller scale versions of the maps based on Global Positioning System (GPS) data were reproduced in the DEIS.

The biological value of the proposed KRA is described in the DEIS on page 4-68.

Ownership of land in the proposed KRA is disclosed in the DEIS (Chapter 2, Table 2-6, page 2-42).

In the proposed KRA, 99 percent of the mineral estate is federal, with the remaining 1 percent being federal coal mineral estate only. In the proposed KRA, 54.3 percent of the surface estate is federal, 32.3 percent is privately owned, and 13.4 percent is held by the State of Wyoming.

RESPONSE TO COMMENTS

Only those federal surface or mineral estate activities requiring BLM authorization would be managed within the proposed KRA. The BLM does not manage the use of private or state surface or mineral estate.

The existing oil and gas leases would remain available for exploration and development subject to standard lease stipulations and the land use decisions specified in the RMP with provisions for further analysis should field development be proposed.

Information on other resource values in the proposed KRA is disclosed in the DEIS in Chapters 3, 4, and 5, as well as in technical reports referenced in those chapters. The DEIS discloses other uses, such as the designated right-of-way corridor, in the proposed KRA.

Please also refer to responses to comments 19-2, 20-1, 24-1, 30-1, 32-2, 42-40 and 42-41 for more information.

Comment 43-2: See Comment 43-1.

Comment 43-3: The DEIS states that, "For the most part, this EIS will provide sufficient analyses to allow the BLM to utilize administrative determination(s) and categorical exclusion reviews to determine if surface disturbing proposals should be approved. However, prior to surface disturbance on some drill sites...additional site-specific analyses may be required." (Emphasis added.) (See DEIS page 1-11.)

Comment 43-4: The section discussing the Chevron 43 well correlatives right issue and the process followed for resolution is included to provide background information and to disclose activities which took place while the EIS was being prepared.

Comment 43-5: The BLM appreciates and recognizes the value of the scientific data supported and funded by the operators.

Comment 43-6: Access to the most recent scientific data, logical assumptions, and existing management provide sufficient information for BLM to develop reasonable scenarios for analysis and planning purposes.

Only well locations were projected for analysis. Assumptions were made on the anticipated length/width of future roads and pipelines. Based upon these assumptions, projections were then made on the amount of surface disturbance that would occur. As future roads and pipelines are built, these assumptions along with recommended mitigation measures for the area of disturbance will be used to determine if the proposal falls within the parameters of the EIS analysis.

Title 40 CFR § 1501.2 (c) requires that agencies "Study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts..." At 40 CFR § 1502.1, it discusses the primary purpose of an environmental impact statement as it states "It shall provide full and fair discussion of significant environmental impacts and shall inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment."
RESPONSE TO COMMENTS

With this in mind, the EIS analyzed the proposed action and two reasonable alternatives which were designed to avoid or minimize the adverse impacts to raptors and their habitats.

Comment 43-7: The application process summarized on page 2-5, first paragraph, states that "Following the on-site evaluation, the applicant will file the application which would include site-specific construction plans where necessary ..." and includes detailed engineering design as one of the plans that may be necessary. This acknowledges those situations where detailed engineering design may be required.

Figure 2-9 has been corrected to reflect the additional dehydrator and separator.

Figure 2-11 shows a Typical Completed Wellbore Diagram for a Vertical Well drilled within the Cave Gulch Unit, and is intended to display how a completed wellbore would generally look. The size of casing set, the depth at which the casing is set, and the size of production tubing will likely vary by each individual well drilled in the Unit. The FEIS has been modified in the Errata where necessary to reflect changes resulting from your other comments.

Comment 43-8: Alternative A includes development of up to 28 centralized production facilities within units or non-unitized leases and up to 2 centralized compression stations in the project area (in addition to the proposed liquids recovery plant). The assumption used in the De/EIS analysis is that individual or twin well pads would be designed or enlarged to accommodate centralized production facilities. This has been clarified in the Errata.

Comment 43-9: Alternative A does not include removal of existing production facilities in conjunction with implementation of centralized production facilities. The centralized production facilities would only apply to new wells.

Comment 43-10: Based on documented research, the provision of 1-mile buffers surrounding ferruginous hawk nests under Alternative A should, given an adequate prey base, maintain the viability of these nests.

Comment 43-11: Alternative A, on page 2-36, states that each unit, or individual lease that is not unitized, would have centralized facilities constructed. Further, it clarifies that where bottomhole well density is 20-acre or 40-acre, there would be an average of one central facility per 160 acres. Where the bottomhole well density is over 40 acres spacing, there would be an average of one central facility per 640 acres. Thus, operators would neither be forced to go off-lease and obtain rights-of-ways, nor would multiple operators be required to share central facilities.

Comment 43-12: Under Alternative A, it would be necessary to maintain a list of active "nests" and to identify occupied nests each year. These monitoring activities are the BLM's responsibility, and it is expected that these could be performed during the course of reviewing/permitting the actions especially while field development is rapid when BLM personnel would frequently be working in the project area. The territory boundaries would not need to be defined.

The BLM does not have a written definition for field development as each situation would be unique. However, field development should be viewed as the number of wells and the production facilities determined by the operator(s) within a field or geographic area that would be necessary to orderly and efficiently extract hydrocarbons from the producible formation(s). In this case, the plan of development initially offered by the operators for development of the Cave Gulch-Bullfrog-Waltman project area could suffice as the field development. Field development plans and plans of development are subject to change as conditions warrant, provided these changes are covered within the realm of the applicable environmental document.

Comment 43-13: In addition to the information cited at page 4-64, a comparison of Figures 1-2 and 3-11 shows the existing facilities in physical relationship to the selected nests, page 3-65, paragraph 4 describes nest use for the 1996 season; Table 3-18 describes use for each of the 11 nests during the 1995 and 1996 seasons and nest condition. No specific expertise has been received to show that the selected nest buffers, if not further developed, would not be good selections. Determination of boundaries for the selected nest buffers was done primarily through the use of topographic maps, and was partly based upon field analysis using line of sight. Variation of the height of drilling rigs was not a consideration.

See also the response to 45-9.

Comment 43-14: The text at pages 2-38 and 2-39 does not make a resource area wide requirement for analyses of these kinds of mitigation for field development, but does describe a process. At page 2-39, the text clarifies that such mitigation would be applied only if evaluated and selected in a field development environmental analysis. Rather than establish a requirement, the information is given to define that such mitigation must be appropriate and necessary for a particular development situation.

Analyses of year-round buffers, increased seasonal buffer, and other changes to the usual mitigation could be done in any NEPA analysis to provide reasonable alternatives or mitigation techniques.

The Draft EIS is not a decision document, rather its primary direction is to disclose potential environmental impacts that may result from the proposed action and consider a range of alternatives to reduce the impacts. The buffer zone for the protection of a resource is a valid consideration.

Please also refer to response to Comment 45-1.

Comment 43-15: The Proposed Action does not specify where in the project area the 23 deep test wells would be located, only that those wells would be drilled on 330- to 640-acre spacing. Although the deep test wells are to be drilled on larger downhole spacing areas, the surface well locations will fall within the 20-, 40-, 80- and 160-acre spacing areas in the project area. Similarly, Alternatives A and B do not specify locations for the deep test wells. The number of wells identified under Alternatives A and B includes the deep test wells, with the assumption being that those wells could be within any of the spacing areas identified under those alternatives. The surface disturbance estimated for surface well locations under Alternatives A and B includes that which would be involved for development of the deep test wells.
RESPONSE TO COMMENTS

Comment 43-16: The federal oil and gas lessees in the proposed KRA were identified in the BLM, WRMO's April 1996 report. The DEIS was sent to those lessees.

The socioeconomic impacts of restrictions on oil and gas development in the proposed KRA are disclosed in Chapter 4 (Section 4.11). Since no restriction of grazing use in the proposed KRA is proposed under Alternative B, analysis of socioeconomic impacts on grazing is unnecessary.

Figure 5-2 of the Draft EIS shows the importance of the proposed KRA as having 24 nests in 9.7 square miles (Draft EIS at page 4-67) of the total 170 nests in the GRA in 273 square miles (Draft EIS pages 5-20 through 5-22). For 1996, the density of occupied nests was also greater for the proposed KRA than for the remainder of the GRA (Draft EIS pages 5-22 through 5-25).

Please also refer to response to comments 19-2, 24-1, 43-1 and 43-15 for more information.

Comment 43-17: Permits from the USFWS and WGFD would not necessarily be available based upon the analysis and a decision within this EIS. The decisions of those agencies are discretionary, requiring that all possible avoidance and mitigation of impacts be accomplished. Even then, there would be a need to show that the loss of nests could not be avoided.

See also the response to comment 12-1.

Comment 43-18: There is no conflict. Based on the distribution of sensitive soils (Figure 3-3, page 3-17) and steep slopes (Figure 3-4, page 3-18), and the potential well locations shown in Figures 2-1 (page 2-2), 2-12 (page 2-37), and 2-13 (page 2-41), and realizing that linear facilities would need to link up these well sites, it would be unlikely that the project could totally avoid such areas.

There is no conflict. The paragraph labeled "Permeability" on page 3-23 summarizes the available soils data and evidence summarized in Table 3-5. Areas with sandy soils (sandy loam, silty sands, etc.) generally have relatively high infiltration and permeability rates relative to reserve pits as stated in paragraph 2, page 3-36. Soils must have a very slow permeability (10^-1 cm/sec) for liners to not be required. Therefore, liners would be required as stated in Section 4.4.5, bullet #13 (page 4-41).

There is no conflict. The total project area (25,093 acres) is comprised of either areas with poor or worse reclamation potential (32 percent) and the balance is comprised of areas with better than poor potential (i.e., fair or better). 100-39=61 percent). Sensitive soils include approximately 65 percent of the project area re-iterates what the DEIS states.

There is no conflict. In most areas, moderate fertilizer application could effectively enhance revegetation success. This would depend on site-specific soil character and the location of project facilities. Please refer to Appendix B, page B-3. Short-term objectives require immediate stabilization of the exposed soil surface through the initiation of new vegetation. Application of fertilizer in certain areas would enhance the effectiveness of attaining this goal. As indicated in the DEIS (Section 4.5.3.1, page 4-44, last paragraph), it takes native vegetation 20 to 30 years to become established in regard to similar species composition and horizontal and vertical structure. In contrast, soil and watershed stabilization may take only as long as five years. However, since such stabilization is of major importance in regard to resource conservation, the application of fertilizer can increase the probability of attaining the short-term goal of soil and watershed stabilization within five years.

Comment 43-19: The 18 groundwater right permits are within the project area. See Appendix E of the Soils, Water, and Vegetation Resources Technical Report (ECOTONE 1997) for locations of these permits.

Comment 43-20: Table 3-8, page 3-30 summarizes an assessment of all existing soil disturbance as of June 7, 1996, based on aerial photograph interpretation and as updated through October 1, 1996. This is the most accurate and current information on soil disturbance in the project area. Most of the disturbance included in Table 3-8 may be associated with activities not authorized through a ROW process.

Comment 43-21: Page 3-59. Thank you for this correction. The FEIS text has been modified as an errata item to reflect this change.

Page 3-65. Chapter 3 includes the discussion of nesting activity and status within the Cave Gulch-Bullfrog-Waitman project area only, the proposed KRA nests are identified as part of the GRA.

As discussed in Section 3.7.2 the raptor monitoring and nest inventory process was initiated in 1994, therefore, no data were available for 1993. Table 3-18 of the DEIS (page 3-68) includes existing nest data for all nests within the project area for 1994, 1995, and 1996. In addition, detailed data and discussion are provided in the Raptor Technical Report which is referenced in the DEIS.

Generally three nest inspections per season are adequate to determine fledging success. Causes of nest failures are more difficult to determine but can often be determined from the examination of indirect evidence (e.g., coyotes carry eggs off and often bury them, magpies peck holes in eggs at the nest, skunks chew ends off of eggs, humans leave tracks, etc.) or the nest site and through logical deductions.

Comment 43-22: Although motorists traveling County Road 104 don't recreate within the project area, they do vicariously 'use' the visual resource they view. Scenic touring is an important use of many BLM landscapes. The BLM Visual Resource Management manual verifies the value of visual resources.

Comment 43-23: Studies are provided in numerous articles which demonstrate hunter concern about the visual quality of the resource (including big game hunters). These articles are available for review at the BLM Casper office.

The visual resource section of the DEIS strongly supports the importance and value of the scenic quality of the yet undisturbed areas in the Cave Gulch-Bullfrog-Waitman analysis area.

Comment 43-24: Please see the first paragraph of the Air Quality section (page 4-7) of the DEIS, line 10, for the reference to the Air Quality Technical Report. The word "alternate" has been deleted from the heading on page 4-9 (see the Errata section).
RESPONSE TO COMMENTS

The Air Quality Technical Report provides a discussion of the emission controls currently in use by the operators. Compressor engines with Best Available Control Technology (BACT) for NOx are currently used by the operators. In addition, for wells that have the potential to emit more than 50 tons of VOCs per year, BACT is applied. Flaring is currently used to control VOC emissions at the Cave Gulch field.

The discussion regarding use of water and/or chemical dust suppressants was not intended to imply that the operators will be exceeding the 20 percent opacity standard all the time. The discussion was intended to imply that through standard operating procedures the operators can achieve 50 percent dust control on days when adverse dust conditions exist. This was the basis for the dispersion modeling of fugitive dust emissions.

Comment 43-25: See Figure 3-3, page 3-17, and Table 3-5, Predominant Soil Texture. The information presented in the table was derived by the USDA-NRCS. Field reconnaissance of the project area verified this information. Sandy soils are prevalent in the western half of the project area. See Section 2.2.2.2, page 2-14, paragraphs 3 and 4 for a description of the Operators’ proposed action in regard to liners.

Identification of mitigation measures that may have been included as standard operating procedures (SOP) in the Proposed Action is appropriate. If the analysis predicts that certain mitigation measures, even those considered SOP, would avoid or reduce predicted impacts, this finding is disclosed. Further, the identified mitigation measures usually contain more specific information or more clearly define measures which might have been included as SOP under the Proposed Action.

Multic~ng is required to reduce soil erosion to acceptable non-significant levels as presented is Section 4.3.3.1, page 4-17, paragraph 2 and 3. As well as to meet short- and long-term reclamation objectives as stated on page B-3. Erosion control objectives cannot be met if disturbed areas are not protected in some manner. The point of this measure is to require that all areas graded for the production phase should be immediately stabilized. It does not require drill pad surfaces that will be used for drilling or expanded for second entry drilling be stabilized. Any disturbances left unprotected increases the chance of significant erosion occurring. The BLM would be required to determine if construction activities when soil materials are wet would be allowed on a case by case basis.

Please also refer to responses 38-1 and 43-18 for more information.

Comment 43-26: The text discussing total water demand and oil based mud has been modified as requested, in the Errata.

There is legitimate opportunity to avoid sensitive soils and further minimize impacts where they cannot be avoided as discussed in Section 4.3. The impact analysis assumes the use of mitigation measures.

Barrett does have approval to dispose of produced water into the lined evaporation pit at the Bullfrog 1-6. This has been clarified in the Errata.

RESPONSE TO COMMENTS

One of the wells included for interim development was identified as being located in a sensitive soils area (the well proposal was subsequently withdrawn as noted in response to comment 43-33). The June 14, 1996 Decision Record for the interim development environmental assessment required that special soil handling techniques be employed in areas identified as containing sensitive soils. The soils information available to the BLM when interim development was being analyzed was not as specific or detailed as the information gathered in preparation of the EIS, and some differences in data presented in the 1996 EA and this 1997 EIS are to be expected.

Please also refer to responses 42-34 and 43-25 for more information.

Comment 43-27: Significance of Impacts to Raptors. See response to comment 45-3.

Page 4-57. The rationale for the application of seasonal restrictions is to prevent nest desertions and/or reproductive failure under the Proposed Action. Under section 4.7.3.1.4 of the DEIS desertions and/or reproductive failure are described as a potential impact that, in the absence of mitigative measures, would occur. (See response to comment 12-1.)

Increased Public Access. Agree with comment.

Prey Reduction. A temporary reduction in prey populations would result from the physical disturbance of 788 acres of existing habitats. A detailed discussion of this moderate impact is set forth under Prey Related Impacts on page 4-61 of the DEIS.

Zone of Influence. As used in the text on page 4-57, the term "zone of influence" refers to the area surrounding a nest within which the pairs nesting behavior is likely to be affected by the occurrence of human activities. For most raptor species and circumstances, the ½ to ½-mile seasonal buffer zone would be the zone of influence. In some species and under some circumstances the zone of influence may exceed the ¼ to ½-mile seasonal buffer zone.

The relative merits of compressing the construction phase are being considered and the outcome of the analysis will be described in the ROD.

Violation of MBTA. The U.S. Fish and Wildlife Service is the federal agency which has responsibility for law enforcement relative to the MBTA and the Bald Eagle Protection Act. BLM’s responsibility under these laws is to coordinate with the USFWS, which is being done through this EIS process. Specifically, the placement of gas development facilities within close proximity to nests is being addressed as part of the raptor management plan. The USFWS is coordinating with the BLM in preparation of the raptor management plan.

Availability of Unused Territories and Nests. The total number of breeding pairs in a region is generally self regulating and will contain the maximum number of pairs that the prey base and suitable available rearing sites will support. To a large extent, the availability of prey determines the number of breeding pairs a region can support and how large each territory must be to include enough area to provide the required food items to feed young. In low prey years the territories are large and the number of chicks per nest is low. In high prey years the territories are smaller and the number of chicks per nest is higher. With higher prey base pairs defend smaller territories to obtain a given level of food, and thus free up nest sites for additional territories. During years of low prey base when defended territories are large, many if not most of the nest sites within such...
RESPONSE TO COMMENTS

territories go unused. The reason that many nests were vacant in adjacent areas of the GRAA during 1996 is probably because of the low density of prey base which has temporarily reduced the carrying capacity of the entire region.

A second factor limiting the number of pairs and territories that a given area can support is the availability of suitable nesting sites (Kennedy 1980). A shortage of suitable nesting sites often occurs in areas with little topographic relief and no trees. Nests, if they occur in such areas, are generally not successful because of their vulnerability to ground predators such as gopher snakes, skunks, and coyotes.

If pairs that are displaced from the EIS project area seek nesting opportunities elsewhere in the adjacent GRAA, they will probably displace existing pairs from their territories because the habitat there is likely to already be supporting the maximum number of pairs possible for the existing prey base and nest site availability. Forcing more pairs into an area without increasing the prey base or providing additional suitable nesting sites for them to use will only result in competition for the limited number of available territories and nest sites and will result in the displacement of the weakest pairs. This constitutes a loss of a breeding pair from the region. (See response to comment 45-3.)

Therefore, such displacement of birds into adjacent habitats will result in impacts unless such adjacent habitats are improved and the effects of limiting factors are reduced to the point where carrying capacity is increased to accommodate more pairs. Where suitable nesting sites are limiting on an area and prey base is adequate it is possible to improve the raptor habitat and increase the number of pairs by erecting nesting structures. To this end, mitigation has been proposed that involves the placement of ANSs in portions of the GRAA in order to increase the areas over which nesting opportunities exist.

ANSs will be placed in areas of the GRAA where: (1) there are currently no nests, such as areas where there is little or no topographic relief and therefore no nests, and (2) existing nests are on low prominances or on the ground where they are vulnerable to heavy losses by ground predators. By providing nesting opportunities in areas where such opportunities did not previously exist or were marginal, the production potential for any given level of prey base will be increased.

Forcing more pairs into an area without increasing the prey base or providing additional suitable nesting sites for them to use will only result in competition for the limited number of available territories and nest sites and will result in the displacement of the weakest pairs. This constitutes a loss of a breeding pair from the region. (See response to comment 45-3.)

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RESPONSE TO COMMENTS

public meetings. In fact, requests for copies have continued. The BLM paid for the additional copies.

The Bureau of Land Management between January and July 1996, while working on the Draft EIS, completed Environmental Assessment No. WY-062-96-042, Development of Federal Oil and Gas Leases in the Cave Gulch-Bullfrog-Waltman Area During Preparation of the Cave Gulch-Bullfrog-Waltman Natural Gas Development Project Environmental Impact Statement (EIS). The Record of Decision that accompanied this EA allowed for interim development. This is a listing of the federal wells and facilities that were developed during the 1996 field season.

Interim Development Wells and Facilities Developed During the 1996 Field Season

<table>
<thead>
<tr>
<th>Operator</th>
<th>Well Name &amp; Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrett Resources</td>
<td>S. Cave Gulch B-1</td>
</tr>
<tr>
<td></td>
<td>S. Cave Gulch B-5</td>
</tr>
<tr>
<td></td>
<td>Cave Gulch 16 (Deep)</td>
</tr>
<tr>
<td>Chevron USA</td>
<td>Waltman 17</td>
</tr>
<tr>
<td></td>
<td>Waltman 38</td>
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<tr>
<td></td>
<td>Waltman 20</td>
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<tr>
<td></td>
<td>Waltman 43*</td>
</tr>
<tr>
<td></td>
<td>Bullfrog 2-7</td>
</tr>
<tr>
<td></td>
<td>State 44/45 pipelines</td>
</tr>
<tr>
<td>Marathon Oil</td>
<td>Waltman 21-19</td>
</tr>
<tr>
<td>Prima Oil &amp; Gas</td>
<td>POG Cave Gulch 32-12</td>
</tr>
<tr>
<td>CIG</td>
<td>Pipelines, meter station and staging area</td>
</tr>
<tr>
<td>KN</td>
<td>Pipelines and meter station</td>
</tr>
</tbody>
</table>

Chevron's correlative rights issues relative to oil and gas lease number WYW042929 required a field assessment and a new Record of Decision. It was resolved on August 30, 1996. This resulted in the withdrawal of Chevron's Ralston Ficts 1 well and the substitution of the Waltman 43 well as an interim development well.

Not Developed During the 1996 Field Season

<table>
<thead>
<tr>
<th>Operator</th>
<th>Well Name &amp; Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrett Resources</td>
<td>Cave Gulch 17*</td>
</tr>
<tr>
<td>Barrett Resources</td>
<td>Bullfrog 1-6</td>
</tr>
<tr>
<td>Marathon Oil</td>
<td>Waltman 9-5</td>
</tr>
<tr>
<td>Prima Oil &amp; Gas</td>
<td>POG Cave Gulch 32-13</td>
</tr>
</tbody>
</table>

*Chevron's correlative rights issues relative to oil and gas lease number WYW042929 required a field assessment and a new Record of Decision. It was resolved on August 30, 1996. This resulted in the withdrawal of Chevron's Ralston Ficts 1 well and the substitution of the Waltman 43 well as an interim development well.

Barrett Resources did not file an Application for Permit to Drill (APD) for the Cave Gulch 17. Approvals have been granted on the remainder of these wells, but the operators have not drilled them.

Also during this time, BLM prepared EA No. WY-062-96-047 Development of Federal Oil and Gas Leases in the Cooper Reservoir Unit During Preparation of the Cooper Reservoir Field Development Project. The Decision Record signed in July allowed four federal mineral wells and associated facilities, including pipelines to connect to transportation pipeline systems to be developed.

RESPONSE TO COMMENTS

CHAPMAN TRUCKING

Comment 44-1: See response to comments 6-1 and 12-1.

CHEVRON USA PRODUCTION, INC.

Comment 45-1: Analyses of year-round buffers, increased seasonal buffer, and other possible changes in the standard mitigation could be done in any NEPA analysis for which they provide reasonable alternatives. Such analyses of new proposed mitigation measures do not necessarily need to be evaluated within this Cave Gulch-Bullfrog-Waltman EIS process.

Refer also to response to comments 43-1, 43-14 and 43-33.

Comment 45-2: You have correctly stated the CEQ regulations. The CEQ also does not prohibit identifying mitigation measures when considering an array of alternatives or in the proposed action. The NEPA handbook states, "Mitigation measures, if any, should be identified. Mitigation measures are actions developed in response to impacts identified in the analysis which could be taken to avoid or reduce projected impacts."

Comment 45-3: As described at the bottom of page 4-67, displacement of raptors could, in the absence of providing alternative nest sites for them to use, produce significant impacts at the population level. For example: The loss to the GRAA if 6 pairs of displaced ferruginous hawks are unable to nest would be approximately 540 birds over the course of 30 years (assuming an average of 3 young fledged per year per pair). This cumulative loss of new birds to the population has to be considered a significant impact at the population level. Data collected in 1996 indicate that the displacement of ferruginous hawks may have already begun in that this species appears to have been replaced in areas of heavy construction activities by more tolerant red-tailed hawks during the 1996 nesting season. (See Raptor Technical Report.)

Comment 45-4: Please refer to responses to comments 43-13 and 45-9.

Comment 45-5: Thank you for your comment. If an amendment is required as part of the Record of Decision, the BLM will follow the proper process.

Please refer to response to comment 43-14.

Comment 45-6: It has been determined that leases issued without stipulations, particularly a no surface occupancy stipulation, could still be accessed even though an environmental document has been completed which precludes surface occupancy. A taking would result should the entire lease become subject to no surface occupancy. In most cases, however, the entire lease would not require no surface occupancy and portions would be available for development. This would fulfill the basic requirements because access is not necessarily guaranteed for the entire lease.

In the situation described by Chevron, substantial reserves could not be developed even with the use of directional drilling. Whether a regulatory "taking" would occur under the Fifth Amendment...
RESPONSE TO COMMENTS

to the Constitution is a problematic legal question involving, among other things, reasonable investment-backed expectations in the context of a pervasively regulated industry like oil and gas operations on public lands. While findings of regulatory takings are rare, such complex legal questions are best resolved in forums established by Congress for that purpose. It is nevertheless the BLM’s policy to structure its decisions in a way which will avoid any “taking” problems. That policy will be reflected in the ROD for this EIS.

Comment 45-7: A range of alternatives and mitigation strategies are being analyzed, both within the project area and away from it. A broad scale raptor mitigation plan is being developed and will be described in the ROD.

Comment 45-8: The year-round buffers would remain designated for the time that development takes place under this EIS, but are subject to review. The raptor management plan, which will be included in the ROD, will have conditions for re-evaluating the buffers.

New year-round buffer zones would not be delineated for new nests which might become established. If additional development beyond the scope of this EIS is proposed, such that a new analysis was needed, then new mitigation would be considered.

Comment 45-9: Consideration of existing facilities included the following:

The Nest 2 buffer has a facility for the CGU #1/#15 wells and a facility for the CGU #8/#13 wells, but these facilities are located at the edge of the buffer, are on the other side of the ridge from the nest, and are out-of-sight of it.

The Nest 3/4 buffer has the facility commented upon for the Waltman #3 well. The well is shut in. A consolidated facility for the Waltman Unit #20/#37/3A/#42 wells is located at the edge of this buffer zone, is out-of-sight of the nest, and is near 1/4 mile from the nests.

The Nest 5 buffer has no existing facilities.

The Nest 12/15/25/26 buffer has no existing facilities.

The Nest 20 buffer has a facility for the Waltman #1 well, which is close (a few hundred feet) to the nest. However, the facility is on the other side of the ridge from the nest, and is out-of-sight of it. Golden eagles tended nest 20 in 1995 and laid an egg in the nest in 1996.

The Nest 33 buffer has a facility for the Waltman Unit #4 well and a facility for the Waltman Unit #14 well. The facilities are at the perimeter of the buffer zone. Several nests within the buffer zone are within a draw, and most of the nests are out-of-sight of the facilities. Ferruginous hawks were documented during the nesting season in the area of these nests in 1995, and incubated eggs in one of the nests in 1996.

The Nest 72 buffer has no existing facilities.

Comment 45-10: Not all biologists feel that a 1-mile buffer is necessary to adequately protect ferruginous hawk nests and there is considerable difference of opinion as to what size radius is required. The rationale for the use of the 1-mile buffer in this EIS was to provide in one of the alternatives (A) what everyone would agree is a large enough buffer to insulate this species and to analyze the costs and benefits associated with such an action. These costs and benefits will then be compared to those of the Proposed Action and the other alternatives to provide perspectives necessary for the BLM to render informed decisions for the ROD.

Just as in this written comment, many commentors during the public meetings for scoping and for review of the Draft EIS have shared information about raptors nesting at active well sites. However, no documentation has been provided.

We have documented 4 oil/gas well sites in or near the GRAA with raptor nesting situations at the well site. This documentation supports the literature in showing raptor nesting at inactive well sites, but not at active well sites.

In the project area, a ferruginous hawk nest (#3) is located within a couple hundred yards of the Waltman #3 well site. The well has been inactive (shut-in gas well) since September 1994, the period of time that nest visits have been documented by the contract biologists. We have no documentation of raptor利用 of this well before 1994, although the size and condition of the nest makes it reasonable to deduce that it was used at least in terms of adding nesting materials. The most critical need for information would be knowledge of the raptors’ producing young at the nest.

Just north of the project area, in the GRAA, a ferruginous hawk nest has been on a storage tank on the Tepee Flats #16-1 well. The well is documented to have been inactive (shut-in gas well) from August 1988 until December 1996, during which time it was reported by industry to have produced young for several years.

The Warren Enterprises 1-33 well site is in the GRAA, and has never been a producer. Golden eagles raised young to fledging stage in 1996 on a tank at this active well site.

The Wild Horse Butte #2-1 well site has been inactive (shut-in gas well) since April 1994. A good condition nest, which was found on the catwalk in late July of 1996, was determined to have been recently used.

The socioeconomic effects of expanded buffer zones subject to seasonal restrictions have been clarified in the FEIS errata.

See also responses to Comments 42-18 and 43-10.

Comment 45-11: With comprehensive planning for centralized production facilities in conjunction with development of wells within units and non-unitized leases, the cost of consolidated facilities for separation, treatment, storage and gathering on a unit or lease should be similar to the cost of providing such facilities for each well on a unit or lease.

There are opportunities for reduced costs through use of shared compressors, tanks and pipelines being co-located on individual or twin well pads where all-weather access is available. There are also possibilities for increased costs in operation of pipelines needing compression or line heaters, depending upon where production is being taken for treatment or transportation.
RESPONSE TO COMMENTS

In order to conduct a meaningful economic analysis of the costs and benefits of centralized production facilities within the units and non-unitized leases, some specific information on short- and long-term unit and lease development is required. Without this information, further analysis of the costs or benefits of centralized production facilities within the area would be extremely difficult; and, without the analysis, it is unknown whether any additional costs might be incurred that would result in the less productive parts of the field being by-passed. However, the use of centralized production facilities has proven successful and cost effective in other fields and units in Wyoming.

Comment 45-12: In the project area, casual use (surveying of a well site) near a raptor nest resulted in the loss of 2 eggs during the 1996 nesting season. This occurred during a year of a low rate of well site development. It is reasonable to analyze, for years when a high rate of development would occur, a technique which would mitigate this kind of impact.

Chevron and Barrett agreed to the unusual maintenance restriction during the field development EIA (FDEA) phases (20 wells in Barrett’s February 1995 Draft EA and 27 wells in Chevron’s August 1995 Draft EA) in May 1995. The use of this restriction is at least as valid for analysis in the EIS wherein three times as many wells are proposed.

Please refer to Response to Comment 19-1.

Comment 45-13: Please refer to Response to Comments 43-14 and 45-12.

Comment 45-14: Please refer to responses to Comments 19-2 and 45-15.

Comment 45-15: “Compensation” at page 4-68 was used as a biological term rather than as a legal term. That is, most of the biological benefit would be from increasing the raptor production from different pairs than those of the project area.

The establishment of the proposed KRA would not be “compensation” under the terminology of Instruction Memorandum because the lessees and operators would not be asked to do anything or fund anything. All existing rights would be maintained.

Comment 45-16: Unlike mining claim locations, it is at the BLM’s discretion whether to authorize most land uses such as rights-of-way or salable minerals. These land uses would not be prohibited in the proposed KRA, but would be managed. Other activities, such as recreation, usually do not require formal authorization and would only be restricted if there were documented disturbances to raptors from such activities (Chapter 2. Section 2.4).

The federal grazing lessees in the proposed KRA are the same as those in the project area. The grazing lessees were notified during scoping, and the DEIS was sent to those lessees. The proposed KRA federal grazing permits are also the owners of private surface in the proposed KRA.

Please also refer to responses 24-1, 43-1 and 43-16 for more information.

Comment 45-17: Please refer to the response to comment 21-1.

Comment 45-18: In March 1996, the BLM conducted an analysis of four years of federal oil and gas lease sales (February 1992 through February 1996) (referenced in 04/96 WRMG report). Average dollar-per-acre bids for leases offered before October 1994 (Barrett’s discovery well) were $2.04/acre. Dollar-per-acre bids from October 1994 through February 1996 averaged $19.20/acre. This increase in lease bids represents the typical lease bid activity that follows a major oil or gas discovery, and cannot be directly related to determining the oil and gas potential. However, the lease sale information was a factor considered by BLM in the April 1996 report determining the proposed KRA mineral potential.

Please refer to responses to comments 12-1 and 32-2.

Comment 45-19: The equitability of seasonal restrictions under Alternative B is being considered and will be resolved in the ROA.

Please refer to response to comments 6-1, 12-1, 31-6, 43-17, and 45-12.

Comment 45-20: Please refer to response to comment 43-17.

Comment 45-21: Please refer to response 43-15 for more information.

Comment 45-22: Most of the anticipated well locations shown in the Proposed Action, Alternative A, and Alternative B are identical. The 20 acre development scenario for sections 30, 31, and 32; T37N, R86W is identical. The difference between the Proposed Action and the Alternatives is the number of wells to be drilled at the limits of the field. The Alternatives are based on the assumption that the field will be fully developed to the maximum optimum level (all available well sites will be drilled).

The BLM does have the authority to set spacing. The regulations at 43 CFR 3162.3-1 Drilling applications and plans, (a) “An acceptable well-spacing program may be either (1) one which conforms with a spacing order or field rule issued by a State Commissioneer or Board and accepted by the authorized officer, or (2) which is located on a lease committed to a communized or unitized tract at a location approved by the authorized officer, or (3) any other program established by the authorized officer.”

Comment 45-23: This has been corrected in the Errata.

Comment 45-24: Regardless of whether the EIS is called “site specific” or “conceptual”, there is sufficient specificity and flexibility in the DEIS to address the reasonably foreseeable development that might be necessary to fully recover the estimated gas reserves in the project area. Only well locations were projected by the BLM for analysis, with assumptions made on the anticipated length-width of future roads and pipelines. These projections and assumptions are as specific as possible to allow comprehensive analysis, while still providing the flexibility needed for future development. Therefore, your recommendation has not been adopted.

Please refer to responses 42-41, 43-3 and 45-22 for more information.
As described in Chapter 4, the project area is not pristine, that in fact considerable land disturbing activity has already occurred within the project area.

Comment 45-27: The BLM requested a site specific delineation of visual resources on the project area. This delineation identified areas with Class A and Class B scenic quality, some in highly sensitive locations as described in Chapter 3. Using BLM criteria, these would be Class 2 and Class 3 areas. Impacts in these areas would exceed the level of contrast outlined in the BLM VRM for Class 2 and 3 areas. As a result, the impact would be significant.

As discussed in Chapter 4, the significant impacts apply only to the sites with high scenic quality and not to the entire project area, parts of which are not pristine as described in Chapter 3.

Comment 45-28 Please refer to response 43-25

Comment 45-29 This measure is routinely applied by many federal agencies in Wyoming (i.e. FS). It is well known that the primary vector for introducing weeds into an otherwise weed-free area are vehicles and heavy equipment. This is particularly true of those that have been in mud that allow such seed to stick and be transported over long distances. Eliminating this measure would seriously impede effective weed control through pro-active preventative actions.

Comment 45-30 The RMP raptor stipulation is provided in the Addenda. The proposed mitigation by the operators is at page 2-34. 3rd bullet Both sources refer to "active" nests. The RMP raptor stipulation defines "active" as used at least once in last 3 years. The text at page 4-59 has been changed to reflect this. The analysis within the Draft EIS does not change.

Comment 45-25: The FEIS text has been modified as an errata item for clarification.

Comment 45-26: As stated in Chapter 3, Section 3.8 Recreation, data on recreation visitations to the project area are not available, and overall recreation use levels in the project area are generally low. However, the reason the project area is stated as being a very important use for scenic touring is that the south entry onto the South Bighorn/Redwall National Backcountry Byway passes through the middle of the project area. This does not imply that the project area has qualities that provide for scenic touring, merely that the road that accesses areas of high scenic qualities passes through the project area.

As discussed in Section 4.0 Introduction, Impact Significance Criteria are described as the threshold or magnitude at which an impact would be considered significant, thus warranting special attention such as special mitigation. These criteria are based on government regulatory standards, available scientific documentation, previously prepared environmental documents, and the professional judgement of resource specialists. In the case of impacts to the recreation resource, significance criteria were based on previously prepared environmental documents and the professional judgement of resource specialists. It is recognized and documented in the analysis that the project area is not pristine, that in fact considerable land disturbing activity has already occurred within the project area.
Chapter 4 describes the affected environment. For example, ferruginous hawks are more tolerant of human presence than are other raptor species such as the red-tailed hawk. Mule deer and pronghorn are likely to adjust to human presence and thereby create potential problems from colliding with vehicles and/or poaching.

The existing oil and gas leases would remain available for exploration and development subject to standard lease stipulations and the land use decisions specified in the RMP with provisions for further analysis should field development be proposed. Designation of the proposed KRA would not affect existing lease rights. If a decision is made within the ROD to seek a withdrawal, the prescribed procedures would be followed.

A withdrawal of the federal mineral estate in the proposed KRA would not violate section 1714(c)(1) of the Federal Land Policy and Management Act of 1976, as amended. The act specifies that withdrawals of 5,000 acres or more may not exceed a period of 20 years. The act also requires that proposed withdrawals of 5,000 acres or more be submitted for Congressional approval before the withdrawal is effected.

Please also refer to responses 12-1, 24-1, 32-2, and 39-2 for more information.

Comment 46-16: Please refer to responses to comments 25-1, 39-2, and 42-17.

Comment 46-18: This section does not deal with mitigation measures for paleontological resources, but only with the affected environment. However, mitigation is defined in 40 CFR 1508.20(a) to include avoidance.

See response to Comment 42-38.

Comment 46-19: The analysis was done in consultation and coordination with the Wyoming Department of Environmental Quality, Division of Air Quality.

Comment 46-20: Please refer to response to Comment 38-3.

Comment 46-21: The materials presented in Chapter 3, starting on page 3-52, of the DEIS describe the affected environment, in terms of the nature of the wildlife resources that are out there. No attempt to analyze impacts is made in this chapter because this is the purpose of Chapter 4. In Chapter 4 the recognition that wildlife can acclimate to human presence was a consideration throughout the analysis and was factored into the final assessment of impacts. For example, ferruginous hawks are less tolerant of human activities and less likely to accept them than are other raptor species such as the red-tailed hawk. Mule deer and pronghorn are likely to adjust to human presence and thereby create potential problems from colliding with vehicles and/or poaching.

RESPONSE TO COMMENTS

Comment 46-22: Protecting only occupied nests for the nesting season prevents the disturbance of birds, which prevents the impacts described at pages 4-57 to 4-80, and which prevents violation of the laws.

Failing to protect nesting habitat (the territory includes non-occupied nests) on a long-term basis results in the impacts described at pages 4-67 to 4-68.

See also Response to Comment 46-9, and 46-21.

Comment 46-23: Copies of the literature cited in the DEIS which are not generally available in public library systems have been filed at the District Office of the BLM and are available for viewing by the general public. Care was taken in the preparation of the DEIS to adhere to the NEPA process, avoid biases, and to present available factual data and other information pertinent to the analysis of impacts.

Comment 46-24: Surveys of existing data have already identified known fossil localities that should be avoided; field surveys located additional areas where fossils occur on the surface but do not appear to be of scientific significance. For this reason, monitoring during construction was not recommended, but significant fossils may nonetheless be found even where their occurrence cannot be predicted from the known data. If found, such fossils may be avoided, or collected by the operator if this will not cause damage to the specimens. If specimens cannot be collected without assistance from a qualified paleontologist, the operator will bear the costs of collection within the area of surface disturbance (BLM Instruction Memorandum 96-67, p. 4).

Comment 46-25: The BLM agrees that safety should not be sacrificed to limit ground disturbance. Text has been modified in the Errata.

Comments 46-26: Section 6 of the oil & gas lease terms states, "Areas to be disturbed may require inventories or special studies to determine the extent of impacts to other resources. Lessee may be required to complete minor inventories or short-term special studies under guidelines provided by lessor." Further, the lessee/oil & gas operator have an obligation under Onshore Order No. 1 "...to see that their ...operations are conducted in a manner which (1) conforms with applicable Federal laws and regulations... (5) affords adequate safeguards for the environment... Conducting surveys when necessary, ensures that this obligation is met and that Federal and State laws and regulations are not violated.

The BLM requires surveys for important resources in areas where the potential for that resource is known or is likely to occur. Additionally, the BLM uses a tiered approach for NEPA compliance, and may be required to conduct site-specific surveys once exact locations of project components are determined.

The BLM is responsible to provide support in these areas, but if timely processing cannot occur by the BLM to meet the applicants schedules, then the applicant has the option to conduct the survey or clearance work. Compensation for this work by the operators is voluntary.

RESPONSE TO COMMENTS

Comment 46-28: Site avoidance is generally the most efficient and cost effective mitigative measure for cultural resources and will continue to be the primary measure in Cave Gulch. Site burial is an option which is used on occasion where the situation warrants it. It has drawbacks as well as benefits (such as soil compression and potential for disturbance during restoration), which is why the technique is not utilized to a larger extent. Covering sites for physical protection will always be considered where it is an appropriate option.

Regarding mitigation costs, it is the BLM's responsibility to ensure that the requirements of Sec. 106 of the National Historic Preservation Act are met. It is the project proponent's responsibility to underwrite the cost of mitigative measures under the conditions of approval on any APD, just as it is for other resource concerns (erosion control, for example).

Comment 46-29: The Operators proposed directional drilling, and provided information on directional drilling in the project area (Appendix C). The DEIS does not include directional drilling as a mitigation measure, although it is proposed under Alternative A as a means of recovering some of the gas reserves within the year round buffer zones for raptor nests. Therefore, the recommendation is not incorporated in the FEIS.

Comment 46-30: Whether a "small" or "large" operator proposes development of federal oil and gas leases, the BLM must include as part of the analysis the identification of mitigation measures intended to avoid or reduce predicted impacts. In general, and considering the lease bonding requirements, the assumption is that operators have the technical and financial capability to develop projects they propose. The economic feasibility of mitigation measures are considered, but it would be inappropriate for the BLM to provide relief from mitigation measures for some operators based solely upon the "size" of the operator. Therefore, your recommendation has not been adopted.

PETROLEUM ASSOCIATION OF WYOMING

Comment 47-1: Thank you for your comment. See comment 43-33.

Comment 47-2: The "Cave Gulch-Bullfrog-Waltman Operators," referred to as "the Operators" includes the lease operators who are parties to the Memorandum of Agreement (MOA) for preparation of the EIS, as well as "other oil and gas companies" (DEIS section 1.1.1). The use of the term "Operators" and the fact that only certain operators and companies are parties to the MOA, would not exclude other current or future operators or interest holders from developing leases within the project area.

Please refer to response 46-6 for more information.

Comment 47-3: Please refer to response 45-25.

Comment 47-4: Thank you for your comment. The recommendation to relocate certain "Issues and Concerns" to the "Opportunities" section of Chapter 1 has not been implemented. The beneficial and/or adverse impacts of the issues listed by the Commentor are identified through the analysis documented in Chapters 4 and 5, therefore revision at this point would have negligible value and your recommendation has not been incorporated.

Comment 47-5: Please refer to response 43-15.

Comment 47-6: The area within the project area classified as Scenic Quality A and B is shown on Figure 3-12 (page 3-71 of the DEIS). The numbers provided in Chapter 3, page 3-70 have been further refined and clarified in the Errata.

Comment 47-7: The information presented in Sections 3.11.1 through 3.11.3 of the DEIS provides a fairly comprehensive yet not overly encyclopedic description of the economy of Natrona County. Information on employment and earnings by economic sector is provided in addition to a description of important recent economic trends in Natrona County. A brief discussion of the economic base of Natrona County is provided in Sections 3.11.3.1 through 3.11.3.3. A wide variety of economic data was utilized in the socioeconomic assessment of the Proposed Action and alternatives. The socioeconomic information presented in the DEIS is considered the most important information for the assessment of the potential positive and negative effects of the Proposed Action and alternatives. Inclusion of other economic data and comparisons of the local, regional and national trends would provide interesting information but would not alter the conclusions of the analysis.

Comment 47-8: For the purposes of this EIS, the term "best management practices" refers to the construction and reclamation methods and practices identified for protection of soils, water and vegetation resources. The best management practices are summarized in Chapter 4 and Appendix B of the DEIS, and in the Soils, Water, and Vegetation Resources Technical Report, referenced on page 4-17 of the DEIS. Definition has been added to the Glossary in the Errata.

Your recommendation that the BLM adopt the Wyoming Nonpoint Source Task Force policy is beyond the scope of this EIS, and is therefore not incorporated in the FEIS.

Comment 47-9: Regarding the request for a permanent waiver of the seasonal restriction, refer to response to comment 12-1. Regarding the recommendation for restricting placement of ANSS within the 40-mile project area, there are not a sufficient number of sites for ANSS, as described at pages 4-60 and 4-61 of the DEIS. Please also refer to responses to comments 43-27 (Availability of Unused Territories and Nests) and 55-7. The BLM is locating potential sites for ANSS, and some of the lessees/operators are voluntarily identifying proposed sites.

Please also refer to responses to comments 25-1, 30-1, and 45-3.

Comment 47-10: Please refer to the responses to comments 12-1, 19-2, 25-1, 32-2, 39-2 and 45-15.

Comment 47-11: The section number has been corrected as an errata item.

Comment 47-12: There are no "hard" data on the number of recreationists that use the project area or adjacent lands for dispersed recreation. The lack of hard data on dispersed recreation on BLM administered lands is not uncommon. However, the lack of data does not mean that recreation does not occur on these areas.

The user estimates presented in Chapter 3 of the DEIS were provided by BLM staff personnel and through discussions with Casper area sporting goods store merchants knowledgeable of the project
area and vicinity. The BLM cannot dismiss impacts to recreation because there are no "hard" data. Displacing hunters and other dispersed recreation participants that traditionally use the project area would constitute a significant impact.

Comment 47-13: The interpretive exhibits are identified as possible mitigation measures to address the predicted significant impacts to recreational resources. Additional mitigation measures which might directly avoid or reduce the impacts associated with the Proposed Action or alternatives have not been identified through the scoping or EIS public review processes. The decision regarding recommended mitigation will be documented in a Record of Decision (ROD), and the ROD will specify the administrative requirements, including necessary funding for implementation should mitigation measures be selected.


Comment 47-14: Please refer to response 11-1.

ROBIN REINTS

Comment 48-1: Thank you for your comment. See comment 24-1.

F. EARLINE HITTEL

Comment 49-1: The Final EIS is not a decision document, therefore your recommendation has not been incorporated.

Please refer to responses to Comments 38-1, 43-1, 43-16, 45-16, and 51-18.

Comment 49-2: Analysis of an alternative to extend the development beyond the 10-year projection was not considered necessary or appropriate. Development and production of the natural gas resource are driven by the market and public demand for the resource. The pace of development and production is regulated by use in the United States.

Please refer to response 46-6 for more information.

NATRONA COUNTY COMMISSIONERS

Comment 50-1: Please refer to response 11-1.

Comment 50-2: The Proposed Action provides the maximum development scenario in terms of timing and scheduling of development, as well as in the number of wells. As such, maximum development scoping concerns are addressed. Other scoping concerns from the public, and those identified as BLM management concerns, reflect the range of alternatives analyzed in the DEIS. See the Errata for Section 4.11.7 of the DEIS.

Comment 50-3: Please refer to response to comment 50-2.
RESPONSE TO COMMENTS

responsible for the actual implementation of the mitigation. All avoidance, mitigation, and monitoring procedures contained in and approved in the ROD will be enforceable and executable.

Please refer to response to comment 42-29 for the recommended mitigation measure to avoid vehicle collisions.

Comment 51-5: See response to comment 42-29 and 51-4.

Comment 51-6: See response to comment 42-26.

Comment 51-7: See response to comment 42-26.

Comment 51-8: See response to comment 42-27.

Comment 51-9: See response to comment 42-27.

Comment 51-10: Good sagebrush habitats are generally absent from the project area and were generally lacking prior to when oil and gas development began. The fact that 85.5% of the project area is occupied by mixed desert scrub doesn't mean that 85% of the ground is covered with vegetation. In fact this desert area supports a very sparse vegetation and total ground cover is relatively low. The sagebrush that occurs in this desert vegetation type is generally recumbent and/or heavily grazed and is not dense enough or tall enough to qualify as sage grous nesting habitat. Because of the low quality of sagebrush habitats on the project area and the low incidence of sightings of sage grouse or sage grouse signs observed during three years of field work by contract biologists and BLM personnel, it is not unreasonable to conclude that cumulative impacts to this species are not expected. Additionally, no sage grouse leks were found on or within 2 miles of the project area during aerial and ground surveys conducted during the spring of 1997 specifically for the purpose of locating sage grouse leks. It was also confirmed during these surveys that although the project area contains sage brush, plants tall enough and dense enough to provide adequate nesting habitat are generally lacking.

Comment 51-11: Based on the results of sage grouse surveys conducted during the spring of 1997 and three years of ground work on the project area it was concluded that crucial sage grouse habitats do not occur on the project area and that cumulative impacts are not expected.

See response to comment 51-10.

Comment 51-12: See response to comment 42-25.

Comment 51-13: Because the Final EIS is not a decision document, the decision regarding reclamation and seed mixtures will be documented in the ROD. Please also see the last paragraph of response to comment 38-1 and response to comment 51-5.

Comment 51-14: Cumulative impacts to wildlife were addressed in the DEIS at various levels depending on the species and significance criteria introduced in Chapter 4: big game species were analyzed at the herd unit level, sage grouse at the upland game management level, and raptors

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at the agreed upon (BLM, FWS, WGFD, and Proponent) 273-square-mile GRA. Clarification has been made through the Errata.

Comment 51-15: Thank you for bringing this to our attention. FEIS text has been modified as an errata item.

Comment 51-16: Please refer to response 43-37.

Comment 51-17: Please refer to response 43-37.

Comment 51-18: Thank you for advising us of the new information you have available.

Methods for management of mineral activity within the proposed KRA are specified under Alternative B. Management of nondiscretionary activities such as mining claim location and development in the proposed KRA would be accomplished through a withdrawal. A formal withdrawal of the locatable minerals (including uranium) from operation under the 1872 Mining Law would be implemented. The proposed withdrawal would have to be reviewed and approved by the U.S. Congress, after which the Secretary of Interior could authorize the withdrawal. The DEIS discloses what is known about the potential for all minerals in the area, including the area contained in the proposed KRA (Chapter 3, section 3.1).

Please also refer to responses 12-1, 31-6 and 32-2 for more information.

USDI - FISH AND WILDLIFE SERVICE

Comment 52-1: Development of existing leases would be subject to environmental analysis, including field development analysis or an environmental impact statement, if appropriate. Information provided by BLM's Reservoir Management Group assessed the proposed KRA as having a "low" potential for development.

Please also refer to responses to comments 12-1, 31-6, and 43-16 for more information.

Comment 52-2. Please also refer to response to comments 38-1, 42-15, 51-5, and 52-6.

Comment 52-3: Please refer to response to comment 42-24.

Comment 52-4: The first impact significance criterion under Section 4.7.2 has been modified to reflect your concerns about compliance with the Migratory Bird Treaty Act and the Bald Eagle Protection Act and now reads: "Non-compliance with existing BLM, FWS, or WGFD management objectives and laws for wildlife, or BLM stipulations for surface occupancy criteria on oil and gas developments". Additionally, the type of wording you suggested already exists in the first impact significance criterion listed under "listed threatened and endangered species, species proposed for listing, FWS or state sensitive species and federal candidate species".

Comment 52-5: The 1-mile buffer zones for ferruginous hawks you suggest is included as a part of Alternative A and is available for selection by the BLM if this is determined to be the best course of action. The other courses of action that are available for selection are described under the Cave Gulch-Bullfrog-Waltman Natural Gas Development Project Final EIS - June 1997

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Proposed Action and Alternative B where the standard BLM seasonal ¼ to ½-mile buffer stipulation is applied. Under either the Proposed Action or Alternative B, the DEIS analysis predicts that from 4 to 7 pairs of raptors, including ferruginous hawks, will be displaced over time by the proposed development activities and recommends the placement of at least 14 ANSs to mitigate these impacts.

See response to comment 45-10.

Comment 52-6: A plan for executing the ANS mitigation is being developed and will be addressed in the ROD.

Comment 52-7: Thank you for the more recent reference concerning raptors and powerlines. The text of the FEIS has been modified to reflect the updated material. Please also refer to responses 31-6 and 51-6.

Comment 52-8: See response to comment 42-16.

MARATHON OIL COMPANY

Comment 53-1: Thank you for your comment. The opinions and preferences expressed by the public during the EIS scoping process were considered in the impact analysis (Chapters 4 and 5), but little specific information relative to actual impacts to raptors was provided. In predicting impacts to raptors (and other resources present in the project area) accepted professional methodologies and practices were employed, and the analysis findings are disclosed in compliance with NEPA.

Comment 53-2: The fifth impact significant criterion under Section 4.7.2 is in fact stating that “Any effect, whether direct or indirect, that results in long-term decreases in recruitment and/or survival of individuals in a wildlife population “would be adverse and significant by definition and is, therefore, stating the same thing you are suggesting. The same is true for the sixth impact significant criterion.

No conclusion was made in the DEIS stating that, in your words, “the impact of the Cave Gulch-Buffalog-Waltman project and proposed actions are not significant”. Rather, the analysis in the DEIS concluded that impacts of the actions analyzed could be mitigated, or reduced to nonsignificant levels, with the use of ANSs, in addition to other mitigative procedures as described in Sections 4.7.5.2 and 2.2.2.11.

See responses to comments 12-1, 19-2 and 25-1.

Comment 53-3: The cumulative impact section provides estimates of total tax revenues for each alternative for the life of the project. Section 4.11.3.1.11 of the DEIS provides estimates of major tax revenues by year for the ten-year drilling program and totals for the life of the project. The analysis in the DEIS assumes that the seasonal stipulations will be applied similarly for the Proposed Action and Alternative B. Thus, estimated production and tax revenues would be roughly equal for the Proposed Action and Alternative B. See the Errata for Section 4.11.4 for additional

RESPONSE TO COMMENTS

information on estimated socio-economic impacts and tax revenues related to the different seasonal and year-round restrictions for Alternative A. Also see response to comment 50-5.

Comment 53-4: The BLM has made a good faith effort to obtain relevant information important to evaluate reasonably foreseeable significant adverse impacts on the human environment. The DEIS identifies the factors considered for the elements of the environment, and discloses the impact analysis findings. Mitigation measures, or “restrictions,” intended to avoid or reduce predicted impacts are specified even when the impacts are not predicted to be “significant.”

HELEN SCHMILL

Comment 54-1: Please refer to comment 8-1.

WYOMING WOOL GROWERS ASSOCIATION

Comment 55-1: Please refer to comment 8-1.

Comment 55-2: Please refer to comment 47-4.

Comment 55-3: Please refer to comments 12-1 and 43-17.

Comment 55-4: Please refer to comments 43-6 and 45-22.

Comment 55-5: Please refer to comments 47-7 and 53-3.

Comment 55-6: Please refer to comment 47-8.

Comment 55-7: The bald eagle is classified as Threatened and is protected under the Endangered Species Act, the Bald Eagle Protection Act, and the Migratory Bird Treaty Act. The golden eagle is also protected under the Bald Eagle Protection Act and the Migratory Bird Treaty Act.

The rationale for the establishment of the 273-square-mile GRAA is described on page 5-20 of the DEIS. This area is located out of the area of analysis for cumulative impacts, but is the area over which cumulative impacts were analyzed. It is necessary to apply mitigation over the GRAA in order to avoid the significant impacts to raptors that would otherwise occur if these efforts were limited to the 40-square-mile project area.

The concept of the proposed KRA was presented in Alternative B as an option for which the costs and benefits could be analyzed. These advantages and disadvantages will then be compared to those of the Proposed Action and the other alternatives to provide perspectives necessary for the BLM to render informed decisions in ROD.

Please refer to responses to comments 12-1, 25-1, 40-3, 45-15, and 47-9.

Comment 55-8: Please refer to comments 43-29 and 47-12.

Comment 55-9: Please refer to comment 43-30 and 47-13.

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Comment 55-10: Please refer to comment 11-1.

RENEE TAYOR

Comment 56-1: Please refer to comments 40-1, 43-30, and 47-7.

Comment 56-2: Please refer to comments 43-15 and 47-6.

Comment 56-3: The equitability of applying the combination of the proposed KRA, seasonal restrictions, and ANSs under Alternative B is being considered and will be resolved in the ROD.

Please refer to responses to comments 43-3, 45-24, and 55-7.

Comment 56-4: Within section 1.2.2.1, it clearly states that ½/2 of the pipeline length, depending on well spacing, would be constructed in new or existing roadway.

Comment 56-5: Please refer to comment 42-36.

Comment 56-6: The transportation network described in section 3.12.3 is in reference to the roads developed within the project area "to serve the oil and gas development which has occurred over the past 35 years."

Reference to the Paleo report has been corrected in the errata.

Comment 56-7: Section 4.3.2 (page 4-12) has been corrected in the Errata.

Comment 56-8: Please refer to responses to comments 12-1, 19-2, 21-1, 25-1, 32-2, 43-27, 45-18, and 46-15.

Comment 56-9: Please refer to comments 47-7 and 53-3.

Comment 56-10: Please refer to comment 51-4.

Comment 56-11: Please refer to comment 11-1.

BOB DUNDAS

Comment 57-1: Please refer to comments 40-1, 43-30, and 47-7.

Comment 57-2: Please refer to comments 43-15 and 47-6.

Comment 57-3: Please refer to responses to comments 55-7 and 56-3.

Comment 57-4: Please refer to comment 56-6.


Comment 57-6: Please refer to comments 47-7 and 53-3.

TRUE OIL COMPANY

Comment 58-1: Please refer to comments 40-1, 43-30, and 47-7.

Comment 58-2: Please refer to comments 43-15 and 47-6.

Comment 58-3: Please refer to responses to comments 43-3, 45-24, 55-7, and 56-3.

Comment 58-4: Please refer to comment 56-4.

Comment 58-5: Please refer to comment 42-36.

Comment 58-6: Please refer to comment 56-6.

Comment 58-7: Please refer to comment 56-7.


Comment 58-9: Please refer to comments 47-7 and 53-3.

Comment 58-10: Please refer to comment 51-4.

Comment 58-11: Please refer to comment 11-1.

PARK COUNTY BOARD OF COUNTY COMMISSIONERS

Comment 59-1: Please refer to comment 11-1.

Comment 59-2: The acreage already leased within the proposed KRA would be available for development under the terms of the leases.

Please refer to responses to comments 12-1, 39-2, and 46-15.

USDA, FOREST SERVICE

Comment 60-1: Copies of the DEIS were sent to the USDA-Forest Service, Douglas Ranger District and Planning Team. Copies of the "DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis" (TRC 1997a) were also sent to all individuals, agencies and organizations who requested a copy. In addition, the USDA-Forest Service, Region 2, has been added to the Cave Gulch-Bullfrog-Waltman FEIS comprehensive mailing list.
The BLM appreciates the involvement of the USDA-Forest Service in the planning of natural gas development in the Cave Gulch-Bullfrog-Waltman project area, especially as a participant in the Cave Gulch-Bullfrog-Waltman Air Quality Impact Assessment “Stakeholder” Group. The USDA-Forest Service (along with the WOEQ/AGQ, EPA, and the Wyoming Outdoor Council) reviewed and provided comments on the Air Quality Impact Assessment Protocol before the analysis was performed, and provided comments on the preliminary Air Quality Impact Assessment results. Early involvement by the “stakeholders” improved the quality of the analysis.

Comment 60-2: Please see responses to comments 42-6 and 42-13.

OIL AND GAS CONSERVATION COMMISSION

Comment 61-1: Please refer to comments 12-1, 40-2, 40-5, 43-8, 47-7, and 53-3.

US ENVIRONMENTAL PROTECTION AGENCY, REGION VIII

Comment 62-1: Please see responses to comment 38-2 (Section 3.2.2, Air Quality, Number 1) and comment 42-3.

Comment 62-2: Please see response to comment 42-3.

Comment 62-3: Regarding the Commentor’s “primary comments/questions” on the “DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis” (TRC 1997a), please see responses to comments 38-2 (Section 4.2.3, Direct and Indirect Impacts, Number 7), comment 42-3, and comment 42-7.

1. Potential formaldehyde emissions from compressors were listed in Table 2.3, page 2-7, of the “DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis” (TRC 1997a).

2. Table 2.4 has been revised to read “Summary of Maximum Annual Production Emissions,” and includes a corrected specified summation of HAPs emissions. These corrections are included in the FEIS Section 2 - Addendum and Errata.

3. Please see response to comment 42-3.

4. Please see response to comment 38-2 (Section 4.2.3, Direct and Indirect Impacts, Number 4).

5. The surface-based construction and road emission sources were modeled as volume sources as recommended in the ISC3 User’s Guide (EPA 1995b; Volume 2, Section 1.2).

6. The actual model input files and analysis results will be provided separately to the commentor, and to any other individual upon request.

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Figure 5.2 and Figure 5.3 have been revised to include “Note: basic receptor grid spacing is 100 meters; additional receptor spacing is less, as indicated.” These corrections are included in the FEIS Section 2 - Addendum and Errata.

Table 5.6, third column, has been revised to read “Range of State 8-hour AACls.” This correction is included in the FEIS Section 2 - Addendum and Errata.

The sentence has been revised to read “Potential cancer risks are considered acceptable up to 1e-06 for determining risk-based remediation.” This correction is included in the FEIS Section 2 - Addendum and Errata.

Table 5.7 has been revised to include “Note: n/a - non-additive.” This correction is included in the FEIS Section 2 - Addendum and Errata.

The sentence has been revised to read “This concentration is very conservative since the nomograph was developed using meteorological conditions more conducive for forming ozone than would be found in the analysis area.” This correction is included in the FEIS Section 2 - Addendum and Errata.

Please see response to comment 42-3.

The sentence has been revised to read “The Cave Gulch-Bullfrog-Waltman well field emission sources modeled for the far field analysis included only NOx production sources—the well site separator heaters and dehydration units, and the compressor engines, as the “worst case” emission scenario.” This correction is included in the FEIS Section 2 - Addendum and Errata.

As stated in the “DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis” (TRC 1997a), page A2-7: “The gas plant does not play a role in either emission scenario [near- or far-field].” The gas plant compressors would have a lower emission factors than in-field or centralized compressors. Utilization of in-field or centralized compressors to meet full compression demand is the conservative assumption.” Since either the proposed gas plant or the compressor station would be built, the air quality impact analysis included the “worst case” compressor station emission assumption.

As stated in Section 2.1.1 (Proposed Action and Alternatives - Alternative Selection Process - Proposed Action) of the DEIS, page 2-1: “For planning purposes, the Operators divided the project area into four areas as shown on Figure 2-1 … because they felt these areas better defined the Proposed Action than the two area map presented in the WRMG final report …” The four areas have no special significance regarding the air quality impact analysis.

The sentence has been revised to read “Gaseous and particulate deposition velocities for NO, NO2, and nitrate used in this spreadsheet were determined from data appearing in Atmospheric Science and Power Production (DOE 1984).” This correction is included in the FEIS Section 2 - Addendum and Errata.

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16. As stated in the "DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis" (TRC 1997a), page 5-19, "Since the proposed well field emissions are many small emissions sources, uniformly spread out over a large area, discrete visible plumes are not likely to occur, and the issue of concern is potential increased regional haze.

However, a separate Visual Impact Screening Model (VISCREEN) assessment was performed (TRC 1997b) to determine if a plume from the 12,000 hp compressor would be visible inside or outside the Cloud Peak Class II Wilderness Area (EPA 1996). Based on the conservative model default assumptions (including the model's maximum allowable background visual range of 336 km), none of the screening criteria were exceeded.

17. Table A-6, page A1-13, represents the potential air pollutant emission from limited flaring during well completion and testing. Well production emissions are presented in Appendix 2.

18. All air pollutant emission assumptions were based on the information provided in the "DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis" (TRC 1997a), Appendix 2, Attachment 1 (Air Quality Permit Applications).

19. NOx emissions for the gas plant were based on the information provided in the "DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis" (TRC 1997a), Appendix 2, Attachment 1 (Air Quality Permit Applications).

20. The gas plant and in-field (or centralized) compressors emissions were based on the information provided in the "DEIS: Cave Gulch-Bullfrog-Waltman Air Quality Technical Support Document: Cumulative Air Quality Impact Analysis" (TRC 1997a), Appendix 2, Attachment 1 (Air Quality Permit Applications).

Also, please see response to comment 62-3 (Number 13).

21. Please see response to comment 62-3 (Number 13).

MELVIN L. KNIGGE

Comment 63-1: Please refer to responses to comments 12-1, 19-1, 24-1, and 25-1.

WYOMING OUTDOOR COUNCIL

Comment 64-1: Please see response to comment 42-3.

WYOMING OUTDOOR COUNCIL

Comment 65-1: Please see response to comment 42-3.
A Technical Support Document was prepared that describes the cumulative air quality impacts of natural gas development at the Cave Gulch-Bullfrog-Waltman proposed natural gas development near Waltman Wyoming (BLM, 1997a). The results of the analysis were summarized in the Cave Gulch-Bullfrog-Waltman Natural Gas Development Project. Draft Environmental Impact Statement (DEIS) (BLM,1997b). Since the DEIS was published new information was obtained that affects the “far field” cumulative air quality study. Based on the new information and on comments received on the DEIS a new cumulative air quality study was performed. This addendum provides a revised “far field” cumulative air quality study for the Cave Gulch - Bullfrog - Waltman development area.

The revised air quality study includes analyses of potential acid deposition and visibility degradation at the Cloud Peak Wilderness Area. For acid deposition the pollutants of concern are NOx and SOx and for visibility degradation the pollutants of concern are PM10, NOx, and SOx. The estimated pollutant emissions from the proposed Cave Gulch - Bullfrog - Waltman well field plus emissions from other potential sources in the cumulative study area were included in the analysis. A map showing the cumulative study area and the locations of all the emissions sources that were analyzed in this analysis is provided in Figure 1.
2.0 EMISSIONS SCENARIOS

The cumulative air quality study includes pollutant emissions from three groups of sources.

- The maximum potential annual average production emissions from the Cave Gulch - Bullfrog - Waltman well field when all 202 (42 existing and 160 proposed) wells are in production with compression operating at maximum capacity (15,000 hp), (BLM, 1997a). These emissions are summarized in Table 1.

<table>
<thead>
<tr>
<th>POLLUTANT</th>
<th>EMISSIONS (Tons per Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM-10</td>
<td>&lt; 0.1</td>
</tr>
<tr>
<td>NOx</td>
<td>303</td>
</tr>
<tr>
<td>SO2</td>
<td>&lt; 0.1</td>
</tr>
</tbody>
</table>

- Emission sources in north central Wyoming (Natrona, Fremont, Washakie, Hot Springs, Big Horn, Johnson, and Sheridan counties) that might have additive air quality effects with the Cave Gulch - Bullfrog - Waltman well field were identified. The most recent two years of Wyoming DEQ permitting records were examined to identify other sources which have been permitted in north central Wyoming but have not been constructed, or have not yet begun operation. The emission sources considered have undergone new source review (NSR) by WDEQ, but may not yet be operating. Thus, these sources could be part of the cumulative impacts but would not be included in background pollutant estimates. The identified sources are summarized in Table 2 along with their respective emission rates.
TABLE 2
WDEQ EMISSION SOURCES INCLUDED IN MODELING ANALYSIS

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>NO\textsubscript{2} Emissions (tons/year)</th>
<th>SO\textsubscript{2} Emissions (tons/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colloid Environmental Tech, Lowell Plant - Big Horn Co</td>
<td>152.7</td>
<td>98.6</td>
</tr>
<tr>
<td>Texaco Garland Compressor Engine - Big Horn Co</td>
<td>10.6</td>
<td>0.9</td>
</tr>
<tr>
<td>Texaco 3 Oil Heaters - Big Horn Co</td>
<td>2.4</td>
<td>53.5</td>
</tr>
<tr>
<td>Texaco Glycol Dehydrator - Big Horn Co</td>
<td>0.0</td>
<td>0.7</td>
</tr>
<tr>
<td>WydBen Sage Creek Bentonite Plant - Big Horn Co</td>
<td>94.2</td>
<td>54.3</td>
</tr>
<tr>
<td>WydBen Stucco Bentonite Plant - Big Horn Co</td>
<td>94.2</td>
<td>54.3</td>
</tr>
<tr>
<td>AMOCO Big Sand Draw - Fremont Co</td>
<td>21.2</td>
<td>0.0</td>
</tr>
<tr>
<td>Colorado Interstate Gas, Bridger Comp. Station - Fremont Co</td>
<td>18.4</td>
<td>0.0</td>
</tr>
<tr>
<td>Molz Construction Company - Johnson Co</td>
<td>14.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Dept of Energy, Naval Petroleum Reserve - Natrona Co</td>
<td>0.8</td>
<td>0.0</td>
</tr>
<tr>
<td>Equitable Resources - Natrona Co</td>
<td>77.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Forest Oil Company - Natrona Co</td>
<td>11.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Intol, Inc - Natrona Co</td>
<td>9.9</td>
<td>0.0</td>
</tr>
<tr>
<td>Kaycee Bentonite Ore Dryer, Natrona Co</td>
<td>10.5</td>
<td>0.0</td>
</tr>
<tr>
<td>Risser &amp; McMurry Co - Natrona Co</td>
<td>11.1</td>
<td>0.7</td>
</tr>
<tr>
<td>Western Gas Resources, Sand Dunes Plant - Natrona Co</td>
<td>11.6</td>
<td>0.0</td>
</tr>
<tr>
<td>Larry's Inc - Asphalt Plant - Sheridan Co</td>
<td>0.0</td>
<td>2.7</td>
</tr>
<tr>
<td>Veterans Administration Medical Center - Sheridan Co</td>
<td>50.5</td>
<td>95.0</td>
</tr>
<tr>
<td>Devon Energy Company - Washakie Co</td>
<td>85.0</td>
<td>0.0</td>
</tr>
<tr>
<td>McGarwin - Moberly Construction - Washakie Co</td>
<td>7.9</td>
<td>0.0</td>
</tr>
</tbody>
</table>


3.0 AIR QUALITY MODELING

The air quality modeling study was performed following the procedures described in the Technical Support Document (BLM 1997a). The ISCST3 model combined with 1991 Casper/Lander meteorology data were used to estimate pollutant impacts at the Cloud Peak Wilderness Area.

In the cumulative impact investigation two separate modeling analyses were performed:

- Modeling of Cave Gulch - Bullfrog - Waltman well field development emissions plus other newly permitted but not yet operating source emissions in the cumulative impact study area (see Figure 1) to estimate atmospheric deposition and water quality changes at the Florence Lake watershed.
- Modeling of Cave Gulch - Bullfrog - Waltman well field development emissions plus other "nearby" newly permitted but not yet operating source emissions to estimate visibility impacts at the Cloud Peak Wilderness Area.

3.1 WATERSHED CONCENTRATIONS AND ACID DEPOSITION

Potential acid deposition and water quality changes at Florence Lake were analyzed. For this analysis proposed emission sources from the Cave Gulch - Bullfrog - Waltman well field shown in Table 1 and other sources identified in Table 2 and Attachment 1, were modeled with the ISCST3 model. Annual average concentrations of SO\textsubscript{2} and NO\textsubscript{2} at Florence Lake were computed and used to estimate acid deposition, change in acid neutralizing capacity (ANC) and change in pH.

The predicted (modeled) annual average SO\textsubscript{2} and NO\textsubscript{2} concentrations at Florence Lake are 0.003 and 0.007 \(\mu\text{g/m}^3\), respectively. These SO\textsubscript{2} and NO\textsubscript{2} concentrations were used, along with Florence Lake ANC values, to calculate the flux of nitrogen and sulfur deposition (kg/ha-yr) to the lake as a function of predicted concentrations and deposition velocities. The nitrogen and sulfur fluxes were then used to compute the potential change in pH and in ANC at Florence Lake. The nitrogen and sulfur deposition flux is then used, along with ANC and representative precipitation values, to compute the potential change in ANC. These computations are shown in Attachment 2.

- Gascoil wells that have been issued Wyoming Oil and Gas Conservation Commission Permits from January 1990- April 1, 1997 (WO&GCC, 1997), and proposed wells in the Madden Deep Unit (BLM, 1997c). Wallace Creek (BLM, 1997d), and Cooper Reservoir (BLM, 1997d), well field development areas. These wells are listed in Attachment 1. The pollutant emissions from each of the wells was estimated as 0.44 tons per year of NO\textsubscript{2} (from well site dehydrator/separators).
The potential change in ANC at Florence Lake is 0.5 percent. A limit of 10 percent change in ANC reduction has been adopted by the USDA-Forest Service for lakes with ANC over 25 ueq/l. The maximum predicted change in pH is 0.002, well within the allowable range of 0.1 pH units defined USDA-Forest Service.

3.2 VISIBILITY

Visibility degradation at the Cloud Peak Wilderness area was analyzed following the procedures described in the previous air quality impacts analysis (BLM, 1997a). Specifically, the ISCST3 model was used to estimate the maximum 24-hour average pollutant impacts at receptors along the Cloud Peak Wilderness Area boundary. The maximum 24-hour concentrations were then used in the deciview calculation to estimate visibility degradation.

For this analysis the Cave Gulch - Bullfrog - Waltman production emissions (Table 1) along with emissions from ‘nearby’ proposed sources were modeled. For estimating visibility degradation ‘nearby’ proposed sources whose pollutant plumes have the potential to combine with pollutant plumes from the Cave Gulch - Bullfrog - Waltman sources were identified. These nearby sources included the proposed well field development at Wallace Creek, Cooper Reservoir, and the Madden Deep Unit, along with newly permitted but not operating source emissions from Intil Inc., Equitable Resources, and Colorado Interstate Gas (see Table 2). NO\textsubscript{2} emissions from these sources along with potential particulate emissions from disturbed area wind erosion were the only pollutants considered in the analysis. Sulfur emissions and particulate emissions are insignificant from these sources.

The procedure used for estimating regional haze is then summarized below:

- The maximum 24-hour NO\textsubscript{2} and PM\textsubscript{2.5} concentrations were computed, and the day with the maximum predicted combined impact of NO\textsubscript{2} and PM\textsubscript{2.5} was identified.
- NO\textsubscript{2} concentrations were converted to ammonium nitrate by multiplying by the ratio of the molecular weights (1.742) and 100 percent conversion (i.e.; assuming there is excess ambient ammonium present in the atmosphere).

- The extinction coefficient due to impacts from the well fields was computed using the formula:
  \[ b_{\text{ext,source}} = 0.003 \cdot f(\text{rh}) \cdot [\text{NO}_2] \cdot (1.742) + 0.003 \cdot f(\text{rh}) \cdot [\text{PM}_{2.5}] \]
  where \([\text{NO}_2]\) and \([\text{PM}_{2.5}]\) are the calculated daily concentrations, and \(f(\text{rh})\) (a factor for relative humidity) was assumed a reasonable "worst case" 11.5 for 95 percent relative humidity.
- The background extinction coefficient was determined using pristine conditions, a standard range value (SVR) of 374 km, as provided by the USDA-Forest Service (Blett, 1996). The theoretical maximum possible visibility is 391 km SVR:
  \[ b_{\text{ext,background}} = \frac{3.912}{\text{SVR}} \]
- The maximum daily deciview change was computed from the incremental extinction coefficient due to the well field emissions and the extinction coefficient from seasonal background visibility using the following equation:
  \[ dv = \ln \left(1 + \frac{b_{\text{ext,source}}}{b_{\text{ext,background}}} \right) \times 10 \]
  where:
  - \(b_{\text{ext,source}}\) = extinction coefficient from source impacts, and
  - \(b_{\text{ext,background}}\) = extinction coefficient from background seasonal SVR

Results of this analysis indicated that the maximum predicted deciview is 0.5. Therefore, it is unlikely that well field emissions would cause significant regional haze impacts at the Cloud Peak Wilderness Area.
REFERENCES


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A1-4

A1-5
### COMPUTATION OF TOTAL DEPOSITION
FROM ANNUAL NO₂ AND SO₂ CONCENTRATIONS

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<th>WILDERNESS LOCATION:</th>
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<tr>
<td>POLLUTANT OF CONCERN:</td>
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<td>ANN. CONCENTRATION (ug/m³):</td>
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<td>DEPOSITION VELOCITY (m/s):</td>
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<td>DEP (total-to-dry dep):</td>
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<tr>
<td>R (elemental ratio):</td>
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**EQUATION:**

\[ D = \frac{X(Vd)(R)(DEP)(F_c)}{(Vd)} \]

- \( D \) = Deposition Flux, kg/ha-yr
- \( X \) = Pollutant Concentration, ug/m³
- \( V_d \) = Deposition Velocity, m/sec
  (From Schmel, 1984, Table 12.5)
- \( R \) = Ratio of elemental composition
  - 32/64 = 0.5 for SO₂
  - 14/46 = 0.3 for NO₂
- \( DEP \) = Total to dry deposition ratio
  - 2.0 for SO₂ and NO₂
- \( F_c \) = units correction (315.4)

| \( N \) | 5 |
| \( S \) | |

**COMPUTED DEPOSITION (kg/ha-yr):**

| NO₂ | 0.0104 |
| SO₂ | 0.0216 |
COMPUTATION OF pH AND ALKALINITY CHANGE FROM ANNUAL DEPOSITION FLUX

WILDERNESS LOCATION: Florence Lake

INPUT DATA

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<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tr>
<td>S deposition (kg/ha-yr)</td>
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<td>N deposition (kg/ha-yr)</td>
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<tr>
<td>C deposition (kg/ha-yr)</td>
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<tr>
<td>ppt (d) in inches</td>
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INTERMEDIATE VALUES

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<td>Hn</td>
<td>0.000075 eq/m²</td>
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<tr>
<td>Hc</td>
<td>0 eq/m²</td>
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<td>A</td>
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<tr>
<td>d</td>
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COMPUTATION OF pH CHANGE

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<td>part 2</td>
<td>-4.4268</td>
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DELTA pH = 0.0020

COMPUTATION OF ALKALINITY CHANGE (%)

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<th>Value</th>
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<tbody>
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<tr>
<td>part 2</td>
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DELTA ANC (%) = 0.46

EQUATIONS

delta pH = \log(A) - \log\{A - [(Hs + Hn + Hc/d)/1000]\}

% alkalinity change = \{(Hs + Hn + Hc/d)/1000\}/(A) x 100

where

- A = alkalinity, eq/l
- d = annual ppt, meters
- Hs = Ds/(10*Rs*32) for SO₂, eq/m²
- Hn = Dn/(10*Rn*46) for NO₂, eq/m²
- Hc = Dc/(10*Rc*60) for COS, eq/m²
- Ds = sulfur deposition (from SO₂), kg/ha
- Dn = nitrogen deposition, kg/ha
- Dc = sulfur deposition (from COS), kg/ha
- Rs = sulfur/total weight of SO₂ (32/64 =) 0.5
- Rc = sulfur/total weight of COS (32/60 =) 0.5
- Rn = nitrogen/total weight of NO₂ (14/64 =) 0.3

FROM Fox, D.G., "A Suggested Methodology for an Acid Deposition Screening Technique Applicable Within 200 Km of Isolated Sources," Preliminary Draft, 1983.