

TABLE OF CONTENTS

EXECUTIVE SUMMARY ES-1

1.0 INTRODUCTION 1-1

 1.1 Purpose and Need for Action 1-7

 1.2 Regulatory Authority and Responsibility 1-10

 1.3 Relationship to BLM Policies, Plans, and Programs 1-12

 1.4 Conformance with Existing Land Use Plans 1-12

 1.5 Consultation and Coordination 1-13

2.0 PROPOSED ACTION AND ALTERNATIVES 2-1

 2.1 Proposed Action 2-4

 2.2 Alternative 1 2-9

 2.3 Alternative 2 2-9

 2.4 Alternatives Considered but Not Analyzed in Detail 2-10

 2.4.1 Alternative 3 2-10

 2.4.2 Alternative 4 2-11

 2.5 Comparison of Alternatives 2-11

3.0 AFFECTED ENVIRONMENT 3-1

 3.1 General Setting 3-1

 3.2 Topography and Physiography 3-1

 3.3 Geology 3-3

 3.4 Soils 3-10

 3.5 Air Quality 3-12

 3.6 Water Resources 3-17

 3.6.1 Groundwater 3-17

 3.6.2 Surface Water 3-24

 3.6.3 Water Rights 3-28

 3.7 Alluvial Valley Floors 3-29

 3.8 Wetlands 3-30

 3.9 Vegetation 3-31

 3.10 Wildlife 3-35

 3.11 Ownership And Use of Land 3-51

 3.12 Cultural Resources 3-56

 3.13 Native American Consultation 3-59

 3.14 Paleontological Resources 3-60

 3.15 Visual Resources 3-61

 3.16 Noise 3-61

 3.17 Transportation Facilities 3-63

 3.18 Socioeconomics 3-63

 3.18.1 Population 3-66

 3.18.2 Local Economy 3-66

 3.18.3 Employment 3-67

 3.18.4 Housing 3-67

3.18.5 Local Government Facilities and Services	3-68
3.18.6 Social Conditions	3-68
3.18.7 Environmental Justice	3-68
4.0 ENVIRONMENTAL CONSEQUENCES	4-1
4.1 Direct And Indirect Impacts Of Action Alternatives	4-3
4.1.1 Topography and Physiography	4-3
4.1.2 Geology and Minerals	4-4
4.1.3 Soils	4-5
4.1.4 Air Quality	4-5
4.1.5 Water Resources	4-6
4.1.6 Alluvial Valley Floors	4-9
4.1.7 Wetlands	4-9
4.1.8 Vegetation	4-9
4.1.9 Wildlife	4-11
4.1.10 Threatened, Endangered, and Candidate Species	4-14
4.1.11 Land Use and Recreation	4-14
4.1.12 Cultural Resources	4-15
4.1.13 Native American Concerns	4-15
4.1.14 Paleontological Resources	4-15
4.1.15 Visual Resources	4-16
4.1.16 Noise	4-16
4.1.17 Transportation Facilities	4-16
4.1.18 Socioeconomics	4-17
4.1.19 Hazardous and Solid Waste	4-18
4.2 No-Action Alternative	4-19
4.3 Regulatory Compliance, Mitigation, and Monitoring	4-20
4.3.1 Topography and Physiography	4-20
4.3.2 Geology and Minerals	4-20
4.3.3 Soils	4-20
4.3.4 Air Quality	4-20
4.3.5 Water Resources	4-21
4.3.6 Alluvial Valley Floors	4-22
4.3.7 Wetlands	4-22
4.3.8 Vegetation	4-22
4.3.9 Wildlife	4-22
4.3.10 Threatened, Endangered, and Candidate Species	4-23
4.3.11 Land Use and Recreation	4-23
4.3.12 Cultural Resources	4-23
4.3.13 Native American Concerns	4-24
4.3.14 Paleontological Resources	4-24
4.3.15 Visual Resources	4-24
4.3.16 Noise	4-24
4.3.17 Transportation Facilities	4-24
4.3.18 Socioeconomics	4-24
4.4 Residual Impacts	4-24
4.4.1 Topography and Physiography	4-24

Table of Contents

4.4.2	Geology and Minerals	4-24
4.4.3	Soils	4-24
4.4.4	Air Quality	4-24
4.4.5	Water Resources	4-24
4.4.6	Alluvial Valley Floors	4-25
4.4.7	Wetlands	4-25
4.4.8	Vegetation	4-25
4.4.9	Wildlife	4-25
4.4.10	Threatened, Endangered, and Candidate Species	4-25
4.4.11	Land Use and Recreation	4-25
4.4.12	Cultural Resources	4-25
4.4.13	Native American Concerns	4-25
4.4.14	Paleontological Resources	4-25
4.4.15	Visual Resources	4-25
4.4.16	Noise	4-25
4.4.17	Transportation Facilities	4-25
4.4.18	Socioeconomics	4-25
4.5	Cumulative Impacts	4-25
4.5.1	Topography and Physiography	4-33
4.5.2	Geology and Minerals	4-33
4.5.3	Soils	4-34
4.5.4	Air Quality	4-34
4.5.5	Water Resources	4-36
4.5.6	Alluvial Valley Floors	4-46
4.5.7	Wetlands	4-46
4.5.8	Vegetation	4-47
4.5.9	Wildlife	4-48
4.5.10	Threatened, Endangered, and Candidate Species	4-50
4.5.11	Land Use and Recreation	4-50
4.5.12	Cultural Resources	4-51
4.5.13	Native American Concerns	4-52
4.5.14	Paleontological Resources	4-52
4.5.15	Visual Resources	4-52
4.5.16	Noise	4-52
4.5.17	Transportation Facilities	4-53
4.5.18	Socioeconomics	4-53
4.6	The Relationship Between Local Short-term Uses of Man's Environment and the Maintenance and Enhancement of Long-term Productivity	4-55
4.7	Irreversible and Irretrievable Commitments of Resources	4-56
5.0	CONSULTATION AND COORDINATION	5-1
6.0	REFERENCES CITED	6-1

LIST OF TABLES

Table ES-1	Summary Comparison of Coal Production, Surface Disturbance, And Mine Life for Powder River LBA Tract and North Antelope and Rochelle Mines	ES-8
Table ES-2	Summary Comparison of Coal Production, Surface Disturbance, And Mine Life for Thundercloud LBA Tract and Jacobs Ranch Mine	ES-9
Table 1-1	Wyoming Powder River Basin Coal LBA's Sold	1-3
Table 1-2	Pending and Rejected LBA's in the Wyoming Powder River Basin	1-4
Table 2-1	Summary Comparison of Coal Production, Surface Disturbance, and Mine Life for Powder River LBA Tract and North Antelope and Rochelle Mines	2-13
Table 2-2	Summary Comparison of Coal Production, Surface Disturbance, and Mine Life for Thundercloud LBA Tract and Jacobs Ranch Mine	2-14
Table 2-3	Summary Comparison of Magnitude and Duration of Direct and Indirect Impacts for the Proposed Action, Alternative 2, and the No-Action Alternative for the Thundercloud and Powder River LBA Tracts	2-15
Table 2-4	Summary Comparison of Magnitude and Duration of Cumulative Impacts	2-19
Table 3-1	Acres of Topsoil Available for Reclamation within the Powder River LBA Tract Lease Area and the Entire Area Which Would Be Disturbed by Mining Activities	3-11
Table 3-2	Acres of Topsoil Available for Reclamation within the Thundercloud LBA Tract Lease Area and the Entire Area Which Would Be Disturbed by Mining Activities	3-11
Table 3-3	Regulated Air Emissions for Wyoming	3-12
Table 3-4	Maximum Allowable Increases for Prevention of Significant Deterioration of Air Quality: Particulates	3-15
Table 3-5	Summary of WDEQ/AQD Report on Air Quality Monitoring in Wyoming's Powder River Basin, 1980-1988	3-16
Table 3-6	Acreage Tabulations for Vegetation Types Identified Within the Powder River LBA Tract and the Total Disturbance Area	3-33
Table 3-7	Acreage Tabulations for Vegetation Types Identified Within the Thundercloud LBA Tract and the Total Disturbance Area	3-33
Table 3-8	MBHFI Status in Northeast Wyoming and Expected Occurrence on or near the Powder River LBA Tract	3-42
Table 3-9	MBHFI Status in Northeast Wyoming and Expected Occurrence on or near the Thundercloud LBA Tract	3-49
Table 3-10	Sites Recorded in the Class III Cultural Resource Inventory of the Powder River LBA Tract and Buffer Zone	3-58

Table 3-11	Sites Recorded in the Class III Cultural Resource Inventory of the Thundercloud LBA Tract	3-59
Table 3-12	Fiscal Revenues from Coal Production in Campbell County	3-67
Table 4-1	Comparison of Impacts of Alternative LBA Tracts on Mine Disturbance Area	4-2
Table 4-2	Coal Production & Development Levels, Campbell and Converse Counties, Wyoming	4-29
Table 4-3	Predicted and Actual Coal Mine Disturbance and Reclamation, Campbell and Converse Counties, Wyoming	4-32
Table 5-1	Other Federal, State, and Local Governmental Agencies Consulted In EIS Preparation	5-2
Table 5-2	List of Preparers	5-3
Table 5-3	Distribution List	5-5

LIST OF FIGURES

Figure ES-1	North Antelope Mine and Rochelle Mine Coal Leases and the Powder River LBA Tract As Applied For	ES-2
Figure ES-2	Jacobs Ranch Mine Coal Leases and the Thundercloud LBA as Applied For	ES-3
Figure ES-3	Powder River LBA Tract Configurations	ES-5
Figure ES-4	Thundercloud LBA Tract Configurations	ES-6
Figure ES-5	Existing and Proposed Federal Coal Leases	ES-15
Figure ES-6	Modeled Average Annual PM ₁₀ Concentrations in 2001 Resulting From Removal of 140 Million Tons of Coal at Jacobs Ranch, Black Thunder, North Rochelle, North Antelope and Rochelle Mines	ES-17
Figure ES-7	Modeled and Extrapolated Worst-Case Coal Aquifer Drawdown Scenarios Showing Extent of Actual 15-Year Drawdowns and USGS Predicted Cumulative Drawdowns	ES-18
Figure 1-1	General Location Map with Federal Coal Leases	1-2
Figure 1-2	North Antelope Mine and Rochelle Mine Coal Leases and the Powder River LBA Tract As Applied For	1-6
Figure 1-3	Jacobs Ranch Mine Coal Leases and the Thundercloud LBA Tract As Applied For	1-8
Figure 2-1	Powder River LBA Tract Configurations	2-2
Figure 2-2	Thundercloud LBA Tract Configurations	2-3
Figure 3-1	General Analysis Area	3-2
Figure 3-2	North-South and East-West Geologic Cross Section, Thundercloud LBA Tract	3-5
Figure 3-3	North-South and East-West Geologic Cross Section, Powder River LBA Tract	3-6
Figure 3-4	Stratigraphic Relationships and Hydrologic Characteristics of Latest Cretaceous and early Tertiary and Recent periods. Powder River Basin, Wyoming	3-7

Figure 3-5	Wind Rose, Air Quality, and Meteorological Stations at the North Antelope and Rochelle Mines	3-13
Figure 3-6	Wind Rose, Air Quality and Meteorological Station at the Jacobs Ranch Mine	3-14
Figure 3-7	Coal Production vs. Ambient Particulates for Jacobs Ranch, North Antelope and Rochelle Mines	3-18
Figure 3-8	Monitoring Well Locations Within the Powder River LBA Tract .	3-20
Figure 3-9	Monitoring Well Locations Within the Thundercloud LBA Tract .	3-21
Figure 3-10	Surface Water Features Within and Adjacent to the Powder River LBA Tract	3-25
Figure 3-11	Surface Water Features Within and Adjacent to the Thundercloud LBA Tract	3-26
Figure 3-12	Raptor Nest Sites and Sage Grouse Leks Within and Adjacent to the Powder River LBA Tract	3-39
Figure 3-13	Raptor Nest Sites and Sage grouse Leks Within and Adjacent to the Thundercloud LBA Tract	3-47
Figure 3-14	Surface Ownership Within the Powder River LBA Tract	3-52
Figure 3-15	Surface Ownership Within the Thundercloud LBA Tract	3-53
Figure 3-16	Relationship Between A-scale Decibel Readings and Sounds of Daily Life	3-62
Figure 3-17	Transportation Facilities Within and Adjacent to the Powder River LBA Tract	3-64
Figure 3-18	Transportation Facilities Within and Adjacent to the Thundercloud LBA Tract	3-65
Figure 4-1	Existing and Proposed Federal Coal Leases	4-28
Figure 4-2	Modeled Average Annual PM ₁₀ Concentrations in 2001 Resulting from Removal of 140 Million Tons of Coal at Jacobs Ranch, Black Thunder, North Rochelle, North Antelope and Rochelle Mines . .	4-35
Figure 4-3	Modeled and Extrapolated Worst-Case Coal Aquifer Drawdown Scenarios Showing Extent of Actual 15-Year Drawdowns and USGS Predicted Cumulative Drawdowns	4-40

LISTS OF APPENDICES

Appendix A.	Federal and State Permitting Requirements and Agencies
Appendix B.	Unsuitability Criteria for the Powder River and Thundercloud LBA Tracts
Appendix C.	Coal Lease-by-Application Flow Chart
Appendix D.	BLM Special Coal Lease Stipulations, Forest Service Stipulation, and Form 3400-12 Coal Lease
Appendix E.	Groundwater Rights Affected by the North Antelope and Rochelle Mines
Appendix F.	U.S. Forest Service, Region 2, Sensitive Species
Appendix G.	Selected Plates from "A Study of Techniques to Assess Surface and Groundwater Impacts Associated with Coal Bed Methane and Surface Coal Mining, Little Thunder Creek Drainage, Wyoming"
Appendix H.	Comment Letters and Responses