BLM LIBRARY
88026104

CHEVRON PHOSPHATE PROJECT

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
STATE OF WYOMING
OFFICE OF INDUSTRIAL SITING ADMINISTRATION

DRAFT ENVIRONMENTAL IMPACT STATEMENT

JANUARY 1983

IN REPLY REFER TO:

United States Department of the Interior

1792 (D-490)
Chevron

BUREAU OF LAND MANAGEMENT

P.O. Box 1828
2515 Warren Avenue
Cheyenne, Wyoming 82001

Dear Reviewer:

This draft environmental impact statement (EIS) on the proposed Chevron Phosphate Project is submitted for your review and comment. Please retain this draft EIS for future reference as the final EIS may only be an addendum.

The purpose of this public review is to improve the impact analysis presented in the draft EIS. The final EIS will be prepared considering the comments received.

Comments on the draft EIS may be submitted in writing or presented verbally at a public hearing. As indicated elsewhere in the EIS, a series of public hearings will be held to receive oral comments. In order to be considered in the final EIS, all comments must be received by March 15, 1983.

Please make your comments as specific as possible. Comments will be most helpful if they address the adequacy and accuracy of the impact analysis of the proposed action and alternatives.

A copy of the final EIS will be sent to all persons who provide comments on the draft EIS or who request a copy. Please address written comments and/or requests for copies of either the draft or final EIS to:

Richard E. Traylor, Project Leader
Bureau of Land Management
Division of EIS Services
555 Zang Street, First Floor East
Denver, Colorado 80228

Sincerely yours,

Maxwell T. Lieurance

Maxwell T. Lieurance
State Director
Wyoming State Office

88026104

CHEV .64 DES

TD 195 .F46 C48 1983

DEPARTMENT OF THE INTERIOR
AND THE STATE OF WYOMING

BLM Library
D-553A, Building 50
Denver Federal Center
P. O. Box 25047
Denver, CO 80225-0047

DRAFT
ENVIRONMENTAL IMPACT STATEMENT
ON THE
CHEVRON PHOSPHATE PROJECT

Prepared By

Bureau of Land Management
and
Office of Industrial Siting Administration

January 1983

Director, Office of Industrial Siting Administration

Director, Wyoming State Office

ureau of Land Management
brary
g. 50, Denver Federal Center
nver, CO 80225

COVER SHEET

Chevron Phosphate Project Environmental Impact Statement

(X) Draft ( ) Final

Joint Lead Agencies

U.S. Department of the Interior, Bureau of Land Management
State of Wyoming, Industrial Siting Administration

Cooperating Agencies

U.S. Deparment of the Interior,
Bureau of Reclamation and
Fish and Wildlife Service
U.S. Department of Agriculture, Forest Service
U.S. Department of the Army, Corps of Engineers

Counties That Could Be Directly Affected

Uintah and Daggett Counties, Utah
Sweetwater County, Wyoming

Abstract

This EIS assesses the environmental consequences of State and Federal approval of a phosphate project proposed by Chevron Chemical Company (Chevron). Major project components are a phosphate fertilizer plant complex to be located on private land, 4.5 miles southeast of Rock Springs, Wyoming, a phosphate slurry pipeline extending from Chevron's existing Vernal, Utah mine to the plant complex site; a plant process water pipeline; a slurry water supply (existing tailings pond at the mine site); a railroad spur; a county road relocation; microwave communication system; and an electrical power system (transmission lines and substations). A contract to supply water from the Fontenelle Reservoir has been signed by the State of Wyoming and Chevron Chemical Company. This contract is subject to approval by the Bureau of Reclamation. Alternatives assessed in detail include two water pipelines and associated power distribution lines, and three phosphate slurry pipeline alternative locations. The proposed action would provide for the manufacture and transportation of liquid and pelletized phosphate fertilizer.

Based on the issues and concerns identified during the scoping process, the EIS focuses on the impacts to socioeconomics, water resources, fish and wildlife resources, soils and vegetation, and visual resources. Impacts on six key issue areas (Rye Grass Draw, Red Creek Canyon, Red Creek Basin Escarpment, Jesse Ewing Canyon, Goslin Mountain and Willow Creek) have been identified.

EIS Contact

Comments on this EIS should be directed to:
Richard E. Traylor, Project Leader
Bureau of Land Management
Division of EIS Services
555 Zang Street, First Floor East
Denver, Colorado 80228

(303) 234-6737

Date By Which Comments Must Be Received:
March 15, 1983

TABLE OF CONTENTS

	Page
Public Hearings Information	ix
Preface	xxi
Summary	S-1
Introduction	S-1
Areas of Controversy	S-1
Major Impact Conclusions	S-1
Agency-Preferred Alternative	S-5
1. Chapter 1 · Description of Proposed Action and Alternatives	1-1
1.1. Introduction	1-1
1.1.1 Purpose and Need of Proposed Action	1-1
1.1.2 Location of Project	1-1
1.1.3 Authorizing Actions	1-3
1.1.4 Interrelationships	1-12
Other Proposed or Existing Projects	1-12
Special Management Areas	1-13
1.2. History and Background	1-13
1.3. Overview of Proposed Action and Alternatives	1-14
1.3.1 General Description	1-14
1.3.2 Location of Components	1-16
1.3.3 Land Status and Ownership	1-16
1.4. Proposed Action	1-16
1.4.1 Construction, Operation, Maintenance, Abandonment	1-16
Construction	1-16
Operation and Maintenance	1-16
Abandonment	1-20

Page

1.4.2 Components 1-20

Plant Complex 1-20

Davis Bottom Plant Process Water Pipeline 1-24

Red Creek Canyon Phosphate Slurry Pipeline 1-26

Slurry Water Supply (Tailings Pond) 1-29

Railroad Spur 1-32

Microwave System 1-32

County Road Relocation 1-34

1.5. Middle Firehole Plant Process Water Pipeline Alternative 1-34

1.6. Jensen Slurry Water Supply Alternative 1-34

1.7. Big Sandy Unit, Colorado River Quality Improvement Program Alternative 1-35

1.8. Phosphate Slurry Pipeline Alternatives 1-35

1.8.1 MAPCO 1-36

1.8.2 Northwest 1-36

1.8.3 Willow Creek 1-36

1.9. No-Action Alternative 1-37

1.10. Alternatives Considered but Eliminated from Detailed Analysis 1-37

1.10.1 Truck Transportation of Phosphate 1-37

1.10.2 Phosphate Slurry Line Wyoming Direct 1-37

1.10.3 Northwest Slurry Line Alternative B 1-39

1.10.4 Big Firehole Water Supply Pipeline Alternative 1-39

1.10.5 Railroad Spur (1 and 2 percent grade) 1-39

1.10.6 Water Pipelines Paralleling Proposed and Alternative Slurry Lines to the Green River 1-39

1.10.7 Irish Canyon Alternative 1-39

	Page
1.10.8 Jackson Draw Alternative	1-39
1.10.9 Red Creek Badlands WSA Alternative	1-40
1.11. Summary	1-40
2. Chapter 2 - Energy Efficiency and Comparative Analysis	2-1
2.1. Energy Efficiency	2-1
2.2. Comparative Analysis	2-1
3. Chapter 3 - Affected Environment	3-1
3.1. Impact Area of Influence	3-1
3.1.1 Water Resources	3-1
3.1.2 Socioeconomics	3-1
3.1.3 Transportation Networks	3-1
3.1.4 Air Quality	3-1
3.1.5 Wildlife	3-1
3.1.6 Visual Resources	3-2
3.1.7 Recreation Resources	3-2
3.1.8 Wilderness	3-2
3.1.9 Cultural Resources	3-2
3.1.10 Soils and Vegetation	3-2
3.1.11 Agriculture	3-2
3.2 Proposed Action	3-2
3.2.1 Water Resources	3-2
3.2.2 Socioeconomics	3-3
3.2.3 Transportation Networks	3-13
Plant Complex	3-13
Red Creek Canyon Phosphate Slurry Pipeline	3-13

	Page
3.2.4 Air Quality	3-13
3.2.5 Wildlife	3-16
Plant Complex	3-16
Davis Bottom Plant Process Water Pipeline	3-17
Red Creek Canyon Phosphate Slurry Pipeline	3-18
Booster Pump Station and Power Transmission Line	3-18
Railroad Spur	3-20
Microwave System	3-21
County Road Relocation	3-21
3.2.6 Visual Resources	3-21
3.2.7 Land Use Plans	3-22
3.2.8 Recreation Resources	3-23
Plant Complex	3-23
Davis Bottom Plant Process Water Pipeline	3-23
Red Creek Canyon Phosphate Slurry Pipeline	3-23
3.2.9 Wilderness	3-24
3.2.10 Cultural Resources	3-25
Plant Complex	3-26
Davis Bottom Plant Process Water Pipeline	3-26
Red Creek Canyon Phosphate Slurry Pipeline	3-27
Railroad Spur	3-27
Microwave System	3-27
County Road Relocation	3-27
3.2.11 Soils and Vegetation	3-27
3.2.12 Agriculture	3-30

Page

3.3 Middle Firehole Plant Process Water Pipeline Alternative 3-33
3.3.1 Wildlife 3-33
3.3.2 Visual Resources 3-34
3.3.3 Recreation Resources 3-34
3.3.4 Cultural Resources 3-34
3.3.5 Soils and Vegetation 3-35
3.3.6 Agriculture 3-35
3.4 Jensen Slurry Water Supply Alternative 3-35
3.4.1 Wildlife 3-36
3.4.2 Visual Resources 3-36
3.4.3 Recreation Resources 3-36
3.4.4 Cultural Resources 3-37
3.4.5 Soils and Vegetation 3-37
3.4.6 Agriculture 3-37
3.5 Phosphate Slurry Pipeline Alternatives 3-37
3.5.1 Transportation Networks 3-37
3.5.2 Wildlife 3-38
MAPCO 3-38
Northwest 3-38
Willow Creek 3-38
3.5.3 Visual Resources 3-38
MAPCO 3-38
Northwest 3-39
Willow Creek 3-40
3.5.4 Land Use Plans 3-40

Page

3.5.5 Recreation Resources 3-40

3.5.6 Wilderness 3-41

3.5.7 Cultural Resources 3-41

3.5.8 Soils and Vegetation 3-41

MAPCO 3-42

Northwest 3-42

Willow Creek 3-43

3.5.9 Agriculture 3-43

4. Chapter 4 - Environmental Consequences, Mitigation and Monitoring, and Long-Term Environmental Consequences 4-1

4.1 Significance Criteria 4-1

4.1.1 Water Resources 4-1

4.1.2 Socioeconomics 4-1

4.1.3 Transportation Networks 4-1

4.1.4 Air Quality 4-1

4.1.5 Wildlife 4-3

4.1.6 Visual Resources 4-4

4.1.7 Recreation Resources 4-4

4.1.8 Wilderness 4-4

4.1.9 Cultural Resources 4-5

4.1.10 Soils and Vegetation 4-5

4.1.11 Agriculture 4-5

4.2 Proposed Action 4-5

4.2.1 Water Resources 4-5

Plant Complex 4-5

	Page
Davis Bottom Plant Process Water Pipeline	4-5
Red Creek Canyon Phosphate Slurry Pipeline	4-5
Summary	4-8
4.2.2 Socioeconomics	4-8
Plant Complex	4-8
Red Creek Canyon Phosphate Slurry Pipeline	4-12
Summary	4-14
4.2.3 Transportation Networks	4-18
Plant Complex	4-18
Red Creek Canyon Phosphate Slurry Pipeline	4-18
Railroad Spur	4-18
Microwave System	4-18
County Road Relocation	4-18
Summary	4-18
4.2.4 Air Quality	4-19
Plant Complex	4-19
Davis Bottom Plant Process Water Pipeline	4-20
Red Creek Canyon Phosphate Slurry Pipeline	4-22
Railroad Spur	4-22
Microwave System	4-23
County Road Relocation	4-23
Summary	4-23
4.2.5 Wildlife	4-23
Plant Complex	4-23
Davis Bottom Plant Process Water Pipeline	4-25

	Page
Red Creek Canyon Phosphate Slurry Pipeline	4-25
Railroad Spur	4-26
Microwave System	4-27
County Road Relocation	4-27
Summary	4-27
4.2.6 Visual Resources	4-27
Plant Complex	4-28
Davis Bottom Plant Process Water Pipeline	4-30
Red Creek Canyon Phosphate Slurry Pipeline	4-30
Microwave System	4-30
County Road Relocation	4-30
Summary	4-30
4.2.7 Conflicts with Land Use Plans	4-30
4.2.8 Recreation Resources	4-31
Plant Complex	4-31
Davis Bottom Plant Process Water Pipeline	4-31
Red Creek Canyon Phosphate Slurry Pipeline	4-31
Summary	4-32
4.2.9 Wilderness	4-33
4.2.10 Cultural Resources	4-33
4.2.11 Soils and Vegetation	4-34
Plant Complex	4-37
Davis Bottom Plant Process Water Pipeline	4-38
Red Creek Canyon Phosphate Slurry Pipeline	4-38
Railroad Spur	4-39

	Page
Microwave System	4-39
County Road Relocation	4-39
Summary	4-39
4.2.12 Agriculture	4-39
Plant Complex	4-39
Davis Bottom Plant Process Water Pipeline	4-39
Red Creek Canyon Phosphate Slurry Pipeline	4-40
Summary	4-40
4.2.13 Ruptures and Spills	4-40
Green River Spill	4-40
Flat Land Spill	4-41
Steep Sideslope Spill	4-42
4.2.14 Health and Safety	4-42
Plant Complex	4-42
Rights-of-way	4-43
Summary	4-43
4.2.15 Paleontology	4-43
4.3. Middle Firehole Plant Process Water Pipeline Alternative	4-44
4.3.1 Wildlife	4-45
4.3.2 Visual Resources	4-45
4.3.3 Recreation Resources	4-46
4.3.4 Soils and Vegetation	4-47
4.3.5 Agriculture	4-47
4.4 Jensen Slurry Water Supply Alternative	4-47
4.4.1 Water Resources	4-47

	Page
4.4.2 Air Quality	4-47
4.4.3 Wildlife	4-47
4.4.4 Visual Resources	4-47
4.4.5 Recreation Resources	4-47
4.4.6 Soils and Vegetation	4-48
4.4.7 Agriculture	4-49
4.4.8 Health and Safety	4-49
4.5 Big Sandy Unit, Colorado River Water Quality Improvement Program Alternative	4-49
4.6 Phosphate Slurry Pipeline Alternatives	3-49
4.6.1 Transportation Networks	4-50
MAPCO	4-50
Northwest	4-50
Willow Creek	4-50
4.6.2 Wildlife	4-50
MAPCO	4-50
Northwest	4-51
Willow Creek	4-51
4.6.3 Visual Resources	4-51
4.6.4 Conflicts With Land Use Plans	4-52
4.6.5 Recreation Resources	4-53
MAPCO	4-53
Northwest	4-53
Willow Creek	4-54
4.6.6 Soils and Vegetation	4-54

	Page
MAPCO	4-54
Northwest	4-56
Willow Creek	4-57
4.6.7 Agriculture	4-58
4.7 No Action Alternative	4-58
4.8 Mitigation Not Included in Proposed Action and Monitoring	4-58
4.8.1 Mitigation	4-58
4.8.2 Monitoring	4-60
4.9 Unavoidable Adverse Impacts	4-60
4.9.1 Water Resources	4-60
4.9.2 Transportation Networks	4-60
4.9.3 Air Quality	4-60
4.9.4 Wildlife	4-60
4.9.5 Visual Resources	4-61
4.9.6 Recreation Resources	4-62
4.9.7 Wilderness	4-62
4.9.8 Cultural Resources	4-63
4.9.9 Soils and Vegetation	4-63
4.9.10 Agriculture	4-63
4.9.11 Ruptures and Spills	4-63
4.10 Long-Term Environmental Consequences	4-63
4.10.1 Trends having a Significant Impact on Environmental Values	4-63
4.10.2 Benefits and Trade-Offs	4-63
4.10.3 Commitment of Resources	4-64

Page

References Cited R-1

Glossary G-1

Abbreviations and Acronyms AB-1

List of Preparers P-1

Appendices A1-1

Appendix 1 Consultation and Coordination A1-1

Appendix 2 Required General Measures, Reclamation Procedures, and Chevron Standard Construction and Operation Procedures Designed to Reduce Environmental Impacts A2-1

Appendix 3 Land Status and Ownership by Milepost A3-1

Appendix 4 Resource and Issue Area Maps A4-1

Appendix 5 Endangered Species Act, Section 7 Consultation A5-1

Appendix 6 Visual Resource Management Methodologies A6-1

Appendix 7 Reclamation and Erosion Control Plan Analysis A7-1

Appendix 8 Ruptures and Spills A8-1

LIST OF FIGURES

Figure

1-1 Chevron Phosphate Project Schedule 1-15
1-2 Project Block Flow Diagram 1-22
1-3 Water Intake Structure Plot Plan 1-25
1-4 Booster Pump Station Plot Plan 1-27
1-5 Single Pipeline Right-of-Way Configuration 1-30
1-6 Single Pipeline Adjacent to Another Pipeline Right-of-Way Configuration 1-31
1-7 Typical Microwave Repeater Site 1-33

LIST OF MAPS

Map

1-1 General Location Map of Chevron Phosphate Project 1-2
1-2 Chevron Phosphate Project (located inside the back cover pocket)

		Page
1-3	Plant Complex Area	1-3
1-4	Alternatives Considered but Eliminated	1-38

LIST OF TABLES

Table		
1-1	Major Federal Authorizing Actions	1-3
1-2	Major State Authorizing Actions	1-6
1-3	Major County Authorizing Actions	1-12
1-4	Land Status and Ownership for Proposed Action and Alternatives	1-17
1-5	Proposed Action: Acres Distrubed, Removed and Reclaimed	1-40
1-6	Alternatives: Acres Disturbed, Removed and Reclaimed	1-41
1-7	Construction and Operation Work Force	1-43
1-8	Chemicals Used in the Phosphate Fertilizer Plant	1-44
1-9	Expected Trace Metal Constituents of Water in the Gypsum Impoundment	1-44
1-10	Chemical Constituents of Cooling Tower Mists	1-45
1-11	Project Air Emissions	1-46
1-12	Miles of Facilities not Adjacent to Existing Roads or Other Rights-of-way	1-48
2-1	Energy Efficiency Comparison of the Red Creek Canyon Phosphate Slurry Pipeline with the Alternatives	2-1
2-2	Energy Efficiency Comparison of the Water Pipelines with the Alternatives	2-2
2-3	Process Water Supply Pipeline Comparative Analysis	2-2
2-4	Slurry Water Supply Pipeline Comparative Analysis	2-5
2-5	Phosphate Slurry Pipeline Comparative Analysis	2-8
3-1	1984 and 1990 Population Projections (Uintah and Sweetwater Counties)	3-4
3-2	Current and Projected Employment (Uintah and Sweetwater Counties)	3-5
3-3	1984 and 1990 Projected Income (Sweetwater County)	3-6
3-4	Current and Projected Personnel and Facilities (Sweetwater County)	3-6
3-5	Current and Projected Personnel and Facilities (Rock Springs and Green River)	3-8
3-6	Current and Projected Human Services Personnel (Sweetwater County)	3-9
3-7	Current and Projected Enrollment, Classrooms, and Staff (School Districts 1 and 2)	3-10
3-8	Current and Projected Personnel for Private Schools and Western Wyoming College (Sweetwater County)	3-11
3-9	Projected Housing Characteristics (Sweetwater County)	3-11
3-10	Baseline Revenues and Expenditures for Sweetwater County and Jurisdictions	3-12
3-11	Regional Background Pollutant Data - Annual Averages	3-15

		Page
3-12	Selected Terrestrial and Aquatic Species and Preferred Habitats Affected by the Proposed Action	3-19
3-13	Wildlife Ranges Affected by the Red Creek Canyon Phosphate Slurry Pipeline	3-20
3-14	Total Miles and Acres of Visual Resource VRM Classes and VQO's Affected by the Proposed Action	3-22
3-15	Green River Floating Use from Little Hole to Brown's Park (1981)	3-25
3-16	Vegetation Types Affected by the Proposed Action	3-30
3-17	Vegetation Types Affected by the Proposed Action Surface Facilities	3-31
3-18	Miles of Vegetation Types Affected by Proposed Action Linear Facilities	3-31
3-19	Grazing Allotments by Milepost Affected by the Proposed Action and Alternatives	3-32
3-20	Total Miles and Acres of Visual Resource VRM Classes and VQO's Affected by the Middle Firehole Water Plant Process Water Pipeline Alternative	3-35
3-21	Total Miles and Acres of Visual Resource VRM Classes and VQO's Affected by the Jensen Slurry Water Supply Alternative	3-36
3-22	Total Miles and Acres of Visual Resource VRM Classes and VQO's Affected by the Phosphate Slurry Pipeline Alternatives	3-39
3-23	Miles of Vegetation Affected by the Phosphate Slurry Pipeline Alternatives	3-42
4-1	National and Wyoming State Ambient Air Quality Standards	4-2
4-2	Allowable Air Quality Increments Under Prevention of Significant Deterioration Restriction (ug/m^3)	4-3
4-3	Population Changes resulting from the Proposed Action (Sweetwater County)	4-9
4-4	Average Annual Work Force Requirements for the Proposed Action	4-10
4-5	Projected Employment in Sweetwater County Resulting from the Proposed Action	4-10
4-6	Projected Personal Income in Sweetwater County Resulting from the Proposed Action	4-11
4-7	Projected Net Impact on Personnel, Facilities, and Equipment in Sweetwater County Resulting from the Proposed Action	4-12
4-8	Project Net Impact on Personnel, Facilities, and Equipment in Rock Springs Resulting from the Proposed Action	4-13
4-9	Projected Net Impact on Personnel, Facilities, and Equipment in Green River Resulting from the Proposed Action	4-14
4-10	Projected Net Impact on Personnel Needs and Human Services in Sweetwater County Resulting from the Proposed Action	4-15

Page

4-11	Projected Net Impact on Personnel Needs of Private Schools and Western Wyoming College in Sweetwater County resulting from the Proposed Action	4-15
4-12	Projected Net Impact on Enrollment, Classrooms, and Staff in School Districts 1 and 2 in Sweetwater County resulting from the Proposed Action	4-16
4-13	Projected Housing Demand in Sweetwater County Resulting from the Proposed Action	4-16
4-14	Projected Net Impact on Revenues and Expenditures in Sweetwater County and Jurisdictions Resulting from the Proposed Action	4-17
4-15	Summary of Emission Rates and Significance Levels	4-19
4-16	Maximum Predicted Pollutant Concentrations Resulting from Operation of the Plant Complex	4-20
4-17	Visibility Impairment at Bridger Wilderness	4-21
4-18	Uncontrolled Fugitive Dust Emissions Resulting from Pipeline Construction	4-21
4-19	Gaseous Emissions Resulting from Pipeline Construction	4-21
4-20	Gaseous Emissions Resulting from Operation of Locomotives	4-22
4-21	Acres of Wildlife Disturbed by the Proposed Action	4-24
4-22	Areas of Significant Adverse Visual Resource Impacts caused by the Proposed Action	4-28
4-23	Areas Most Susceptible to Impacts from the Proposed Action Activities	4-35
4-24	Acres of Vegetation Disturbed by Proposed Action Components	4-37
4-25	Acres of Wildlife Habitat Disturbed by the Middle Firehole Plant Process Water Pipeline Alternative	4-44
4-26	Areas of Significant Adverse Visual Resource Impacts Caused by the Middle Firehole Plant Process Water Pipeline Alternative	4-45
4-27	Areas Most Susceptible to Impacts from the Middle Firehole and Jensen Alternatives	4-46
4-28	Areas of Significant Adverse Visual Resource Impacts Caused by the Jensen Slurry Water Supply Alternative	4-48
4-29	Acres of Wildlife Habitat Disturbed by Phosphate Slurry Pipeline Alternative	4-51
4-30	Areas of Significant Adverse Visual Resource Impacts caused by the Phosphate Slurry Pipeline Alternatives	4-52
4-31	Areas Most Susceptible to Impacts from the Phosphate Slurry Pipeline Alternatives	4-55
4-32	Acres of Vegetation Types Disturbed and Occupied by Phosphate Slurry Pipeline Alternatives	4-57
4-33	Short-Term and Long-Term Impacts Resulting from the Proposed Action or Alternatives	4-65

PUBLIC HEARINGS INFORMATION

Public hearings on the Chevron Phosphate Fertilizer Complex Draft Environmental Impact Statement will be held in the following locations:

Public Hearing Locations	Date
Conference Hall Dutch John, Utah 84023 7:00 p.m.	February 15, 1983
Western Wyoming Community College Auditorium College Hill Rock Springs, Wyoming 82901 7:00 p.m.	February 16, 1983

The hearings will be held pursuant to the objectives of the National Environmental Policy Act (PL 9-1190; 83 Stat. 852,853) to receive comments (testimony) on the scope of the EIS and the adequacy of the impact analysis. Testimony presented at these hearings will be considered in the preparation of the final environmental impact statement.

The public hearings will be conducted by a Bureau of Land Management (BLM) official who will be accompanied by other BLM and other federal and state personnel involved in preparing this draft environmental impact statement. The panel members may ask questions of the witness to clarify points in the testimony. All hearing proceedings will be recorded.

Before giving testimony at the public hearing, participants are requested to complete a hearing registration form. A REGISTRATION FORM IS INCORPORATED AS THE LAST PAGE OF THIS VOLUME. Additional forms may be obtained from the address shown on the registration form. Registration forms must be returned to that address no later than February 11, 1983. Participants may also register at the registration desk at each hearing.

Time preferences for presentation of oral statements will be honored whenever possible. A tentative listing of speakers, in the order they will be called, will be available at the registration desk at each hearing.

After the last witness has been heard, the hearings administrator will consider the requests of other persons present who wish to testify. Only one witness will be allowed to present the viewpoint of a single organization at any one hearing. However, any witness will be permitted to give relevant testimony if it is offered as the opinion of a private citizen.

Persons wishing to give oral tesimony will be limited to 10 minutes. Written submissions may also be presented at the hearing.

PREFACE

The purpose of this environmental impact statement (EIS) is to analyze the potential environmental consequences resulting from construction and operation of the proposed Chevron Chemical Company Phosphate Fertilizer Complex and alternatives to this proposed development.

The following Federal action requests initiated the preparation of this EIS: approval of right-of-way grants across public and national forest land for a phosphate slurry pipeline, transmission lines, pump stations, microwave stations, power substations and a water line; and approval of a water sale contract between the State of Wyoming and Chevron. The results of this analysis as documented in this EIS will be used in making decisions on whether to approve, modify or disapprove the above requested actions.

The analysis was based on a proposed schedule of development. Chevron recently announced a 1- to 2-year delay in their project plans. The impacts identified in the EIS will still occur with implementation of the project; only the time period would be different. In addition, the cumulative impacts could be different depending on the revised scheduling of the project. However, this difference cannot be predicted at the present time due to uncertainties in the developmental time frame of Chevron's proposal as well as other projects in the affected area. Prior to granting of any of the requested federal actions, the cumulative impacts will be reevaluated to determine if they fall within the parameters discussed in this EIS.

SUMMARY

Chevron Chemical Company (Chevron) has applied to the Bureau of Land Management (BLM), Wyoming and Utah State Offices, for a right-of-way permit, and the State of Wyoming, Office of Industrial Siting Administration (ISA), for an industrial siting council permit to construct and operate a phosphate fertilizer plant and associated ancillary facilities. The fertilizer plant would initially produce an estimated 2,000 tons per day of liquid and pellitized phosphate fertilizer.

The complex with associated ancillary facilities would be primarily located southeast of Rock Springs, Wyoming, and northeast of Vernal, Utah. The proposed fertilizer complex would use sulfur recovered from Chevron USA's natural gas plant located at Carter Creek, Wyoming; phosphate from Chevron Resource Company's mine at Vernal, Utah; and water from the Fontenelle Reservoir in Wyoming. Various chemicals and materials would be shipped to the plant site over a proposed railroad spur.

Phosphate rock for the proposed fertilizer plant would be supplied by an existing mine and beneficiation plant owned by Chevron Resources Company north of Vernal, Utah. The phosphate rock would be slurried to the plant through a proposed 98.2-mile long, 11-inch diameter buried pipeline that would originate from an existing phosphate mine in Utah. It would run diagonally from the mine through Red Creek Canyon to the Wyoming border and then generally parallel the right-of-way of the Mid-America Pipeline Company (MAPCO) liquid hydrocarbons transportation pipeline in Wyoming. Molten sulfur from the Chevron U.S.A., Inc., Carter Creek gas plant would be shipped to the fertilizer plant by rail from an existing sulfur load-out facility near Kemmerer, Wyoming. Transportation of the sulfur would require construction of a 6.4-mile long rail spur from the main Union Pacific line at Rock Springs to the plant site. (Refer to Map 1-2 for location of the plant, related ancillary facilities, and proposed alternatives.)

Chevron has purchased 22,500 acre-feet of water for the project from the State of Wyoming. This water would be supplied from the Fontenelle Reservoir. Water would be released from the reservoir into the Green River and withdrawn downstream from the Green River near Davis Bottom.

Pacific Power and Light Company (PP&L) would provide electricity for the proposed project. Electrical power for plant construction would be supplied by a new 34.5 kV power transmission line, extending from an existing 230 KV line located 7 miles west of the plant

In addition to the proposed action, several alternatives were identified. The following alternatives are considered in this analysis: (1) Middle Firehole Plant Process Water Pipeline Alternative; (2) Jensen Slurry Water Supply Alternative; (3) the MAPCO, Northwest, and Willow Creek Phosphate Slurry Pipeline Alternatives; and (4) the No-Action Alternative.

AREAS OF CONTROVERSY

In the scoping process conducted during the early stages of the environmental impact statement (EIS) development, several areas of controversy related to the proposed action were identified. Major concerns included air quality, socioeconomic concerns, water quality, visual resources, possible impacts to wildlife and grazing, and grade problems in Jesse Ewing and Red Creek Canyons. A summary of the issues identified through the scoping process is identified in Appendix 1, Consultation and Coordination. In addition, the following key issue areas were identified: (1) Rye Grass Draw, (2) Red Creek Canyon, (3) Red Creek Basin Escarpment, (4) Jesse Ewing Canyon, (5) Goslin Mountain, and (6) Willow Creek.

MAJOR IMPACT CONCLUSIONS

Development of the Chevron Phosphate Project would cause impacts either by displacing resources

(such as removal of vegetation), using resources (such as water consumption), or creating other changed conditions (such as visual scars). The analysis of this project focuses on these kinds of potential impacts. The major anticipated environmental impacts caused from implementation of the proposed action or alternatives are detailed in Chapter 4 with a comparative analysis in Chapter 2.

The analysis indicates that, in general, this project by itself would have impacts of the nature and magnitude that could be managed without undue degradation to other natural resources. Mitigation measures are identified to minimize impacts to resources and/or to provide restoration. General standard measures which will be required by the federal agencies and measures for which there has been a commitment from Chevron are detailed in Appendix 2. Committed measures which will additionally be required and will form a portion of the stipulation package are identified in Chapter 4, Section 4.8. Even so, this project would cause impacts, and these are noted in this EIS.

Water Resources: Implementation of the proposed action would result in a 0.49 percent reduction in flow in the Green River and a milligram per liter (mg/l) increase in salinity at Imperial Dam. However, significantly different changes in flow and salinity could occur based on cumulative water needs of other industrial development, agriculture, and municipal uses. Depletions of water in the Green River could increase to 575,000 acre-feet per year by the year 2000 causing a 20 mg/l increase in salinity at the mouth of the Green River and approximately 11 mg/l increase at Imperial Dam.

Withdrawal of water from Davis Bottom would not have noticeable effect on flow nor affect the water resources of the area.

Construction of the Red Creek Canyon phosphate slurry pipeline would affect Red Creek Canyon (MP 45 through 46). Without careful construction techniques and enforcement of reclamation plans, those points where the pipeline would enter and leave the canyon could also become sediment contributors. For a period lasting approximately 2 months, sediment from Red Creek Canyon could reach the Green River. The degree of impact would depend upon runoff events occurring during and immediately after construction.

With the exception of the phosphate slurry pipeline alternatives which would avoid Red Creek Canyon, the alternatives would have impacts to water resources similar to those identified for the proposed action.

Socioeconomics: No significant impacts would be experienced in Sweetwater County in population, employment, personal income, educational systems, fiscal conditions, and social conditions. Implementation of the proposed action would cause statistically significant impacts in some areas of facilities/services and recreation, but the actual number of additional staff required would be small. There would be significant impacts on housing in Rock Springs during the construction years, but local developers would be able to meet the demand. Impacts on Uintah and Daggett counties, Utah, and the town of Vernal would be minimal. Implementation of the slurry pipeline could result in loss of jobs for approximately 20 contract truck drivers. The ultimate loss cannot be quantified since these drivers might find other employment. Impacts from implementation of the alternatives would be similar to those identified for the proposed action.

Transportation Networks: Construction of the plant complex could significantly affect traffic along Wyoming State Highway 430 from mid-1983 through mid-1985. However, Chevron has agreed to use staggered shifts and busing as required to alleviate some of the traffic congestion. Similar traffic problems could exist along U.S. Highway 191 during construction of the Red Creek Canyon phosphate slurry pipeline.

Implementation of the slurry pipeline could reduce traffic from the mine site to Phoston, Utah, resulting in a positive impact on traffic flow in this area. However, because the Red Creek Canyon pipeline would be in conflict with the existing MAPCO pipeline through Rye Grass Draw, construction of this component could cause damage or shutdown of the MAPCO pipeline. This impact would also occur with implementation of the MAPCO or Willow

Creek alternative and would be considered a significant impact.

Construction of the MAPCO or Willow Creek alternative could have a positive impact on transportation networks by enhancing Daggett County's (Utah) capability to improve an existing county road into Brown's Park, depending upon final alignment. However, during the construction period, approximately 1 month, local and recreational traffic would be disturbed. In addition, construction of the alternatives through Jesse Ewing Canyon would result in numerous and lengthy road closures.

Construction of the Northwest alternative could significantly affect the existing Northwest pipeline for reasons similar to those identified for the MAPCO pipeline alignment. Also some increase in traffic flow could occur during construction near Little Hole Campground.

Air Quality: The amounts of fluoride, total suspended particulates, sulfur dioxide, nitrogen dioxide, and acid mist pollutants that would be emitted from the plant site meet the standards identified in the Wyoming prevention of significant deterioration regulations. Because emissions would cover a broad geographic area and would be temporary, no significant impacts are anticipated from implementation of the proposed action. However, there is some concern that total suspended particulate emissions near Rock Springs be kept to a minimum. There would be no significant impact to visibility.

Construction of other proposed action or alternative components would not significantly affect either Wyoming or Utah air quality standards.

Wildlife: The proposed action would disturb 1,392.5 acres of mule deer, 408.5 acres of elk, and 1,237.25 acres of pronghorn habitat. In addition, about 587.25 acres of sage grouse and 341 acres of whitetail prairie dog habitat would also be disturbed. Habitat losses are not predicted to cause significant impacts because of the total amount of habitat available.

Some population losses could result from harassment and lowered production; however, none of these losses would be significant. There is also concern that birds drinking wastewater from the gypsum impoundment could suffer debilitating or lethal effects. There is a potential for adverse impacts to three federally listed threatened and endangered fish species (Colorado squawfish, humpback chub, and bonytail chub) if the pipeline trench crossed a spawning area. This could result in lowered production potential. In addition, implementation of the Jensen alternative could significantly affect the razorback sucker in Utah.

Impacts from implementation of the alternatives would be similar to those identified for the proposed action except for specific magnitudes as identified in various tables contained within this EIS.

Visual Resources: Implementation of the proposed action and any of the alternatives would significantly and adversely affect visual resources by exceeding the allowable levels of contrast for each visual resource management class (VRM) or visual quality objective (VQO) established for specific portions of the project areas. Specific acreages that would be disturbed for each VRM classification and VQO are identified in various tables throughout this EIS.

Land Use Plans: The only component of the proposed action that would conflict with any existing land use plans would be the Red Creek Canyon phosphate slurry pipeline. Ten miles of the slurry pipeline would conflict with the BLM Vernal District Management Framework Plan, which states that all new pipeline construction should occur within existing right-of-way corridors. In addition, 8.8 miles of this pipeline would be in conflict with the Red Creek Watershed Plan.

Implementation of the Northwest or Willow Creek Phosphate Slurry Pipeline Alternatives would also conflict with the BLM Vernal District Management Framework Plan. The Northwest alternative would have 4 miles of pipeline in conflict with the plan and the Willow Creek alternative, 4. The Northwest alternative would have 3 miles of conflict with the Flaming Gorge National Recreation Area (NRA) Management Plan, and would also be incompatible with the Ashley National Forest Travel Plan. Implementation of other alternatives or components would not affect any known land use plans.

Conflicts of the proposed action or the phosphate slurry pipeline alternatives with the various land use plans could require amendments in order for construction to occur. If amendments were made, depending on the nature of the amendment, a supplemental environmental assessment may be required.

Recreation Resources: Construction activity would create temporary impacts to the recreation resources and to user experiences including sightseeing and float boating activities. Noise and dust generated from construction activity could affect sightseers who visit the John Jarvie Ranch historical site and primitive recreation experiences within the Red Creek Watershed Area of Critical Environmental Concern (ACEC).

The booster station and microwave tower would affect the quality of vista views from the auto day use turn-out overlooking the Red Creek Watershed ACEC. These structures would also impede efforts of those seeking primitive recreation opportunities. Hunting pressures could increase from a predicted population growth in the Rock Springs area. Recreation use would also increase within the Flaming Gorge NRA during the project's 1- to 2-year peak construction period. Recreational use of the Davis Bottom area along the Green River could increase with the use of the all-weather access road.

The Jensen alternative would cause some temporary, short-term impacts to recreation through increased ORV use, and disruption of the vista from construction activities could offend some sightseers.

The Northwest alternative would cross the Flaming Gorge NRA causing significant adverse impacts and considerable public controversy, in addition to being in conflict with the Flaming Gorge NRA Management Plan. Affects from increased ORV use and construction activities would be similar to those identified for the proposed action.

Wilderness: Impacts to the wilderness resource base would be short term (4 to 6 weeks). The sights, sounds, and possible dust migration from pipeline construction activity along the northwest boundary of the Red Creek Badlands WSA could temporarily diminish the quality of primitive and unconfined forms of recreation experiences within the WSA. There would be no impacts to wilderness from implementation of any of the alternative routes.

Cultural Resources: The construction activities of the proposed action or alternatives would cause land disturbance and modification to cultural resources that occur within the area. The impacts could include destruction or alteration of the resources, displacement of artifacts, alteration of the surrounding environment, and introduction of visual, audible, and atmospheric elements out of character with the present environment. These impacts would cause a loss of scientific and cultural information and a loss of a portion of the resource base for future research. The loss of any information could have a significant impact on efforts to reconstruct the prehistory and history of the region.

Soils and Vegetation: The proposed action would disturb 1,516 acres of land of which 740 acres would be occupied. Of the land disturbed, 1,053 acres would occur in sensitive soil areas. Additionally, 1,179.25 acres of sagebrush-grass, 184 acres of pinyon-juniper, 16 acres of greasewood, 12.75 acres of aspen-mountain shrub, and 17 acres of riparian vegetation would be disturbed. Refer to Chapter 2 and the discussions in Chapters 3 and 4 for specific details on the alternatives.

Implementation of the proposed action or the phosphate slurry pipeline alternatives would affect one or more key issue areas. These areas are identified and described in detail in various sections within the EIS.

These six areas include:

- *Rye Grass Draw* - this area contains slopes exceeding 15 percent that would require contour alignment adjustments. This issue area would be affected by implementation of the Red Creek Canyon, MAPCO, and Willow Creek pipelines;

• *Red Creek Canyon* - This area contains a narrow floodplain and a stream course with hard bedrock floor. This area would be affected only by the Red Creek Canyon pipeline.

• *Red Creek Basin Escarpment* - This area contains very steep sideslopes and unstable soil conditions. Implementation of the proposed action and any of the phosphate slurry pipeline alternatives would affect this issue area.

• *Jesse Ewing Canyon* - This area contains a narrow floodplain with hard bedrock floor and slopes greater than 15 percent; the canyon also contains a county road and the MAPCO pipeline. The canyon would be affected by the MAPCO and Willow Creek alternatives.

• *Willow Creek* - This area contains steep and very steep rocky sideslopes and hard bedrock. Only the Willow Creek alternative would affect this area.

• *Goslin Mountain* - This area contains steep rocky sideslopes underlain by hard bedrock. The Northwest alternative would affect this area. These key areas would require more intensive construction, stablization, and restoration measures to minimize soil erosion and other related factors. In addition, more intensive supervision of the reclamation measures would be required.

Agriculture: All components of the proposed action or alternatives would affect areas where livestock grazing occurs. Impacts to grazing would be insignificant to livestock operations from implementation of the proposed action or any of the alternatives. However, there could be significant secondary impacts if the pipeline were left open for periods longer than 1 week, if a path were cleared for livestock trailing, or if livestock abandoned traditional grazing areas. Except for the Jensen alternative, no cropland would be affected by any of the plant site facilities, pump stations, or facility rights-of-way of the proposed action or alternatives.

Paleontology: Impacts to paleontological resources from construction and operation of the proposed action or alternatives would consist of unquantifiable losses of plant, invertebrate, and vertebrate fossils. A number of fossils could be destroyed during construction. Increased collection and removal of known fossils in the region would likely result from increased numbers of people within the area. Appendix 2 identifies several measures that would protect some of these areas encountered by the proposed action or alternatives.

Agency Preferred Alternative

The agency preferred alternative is as follows:

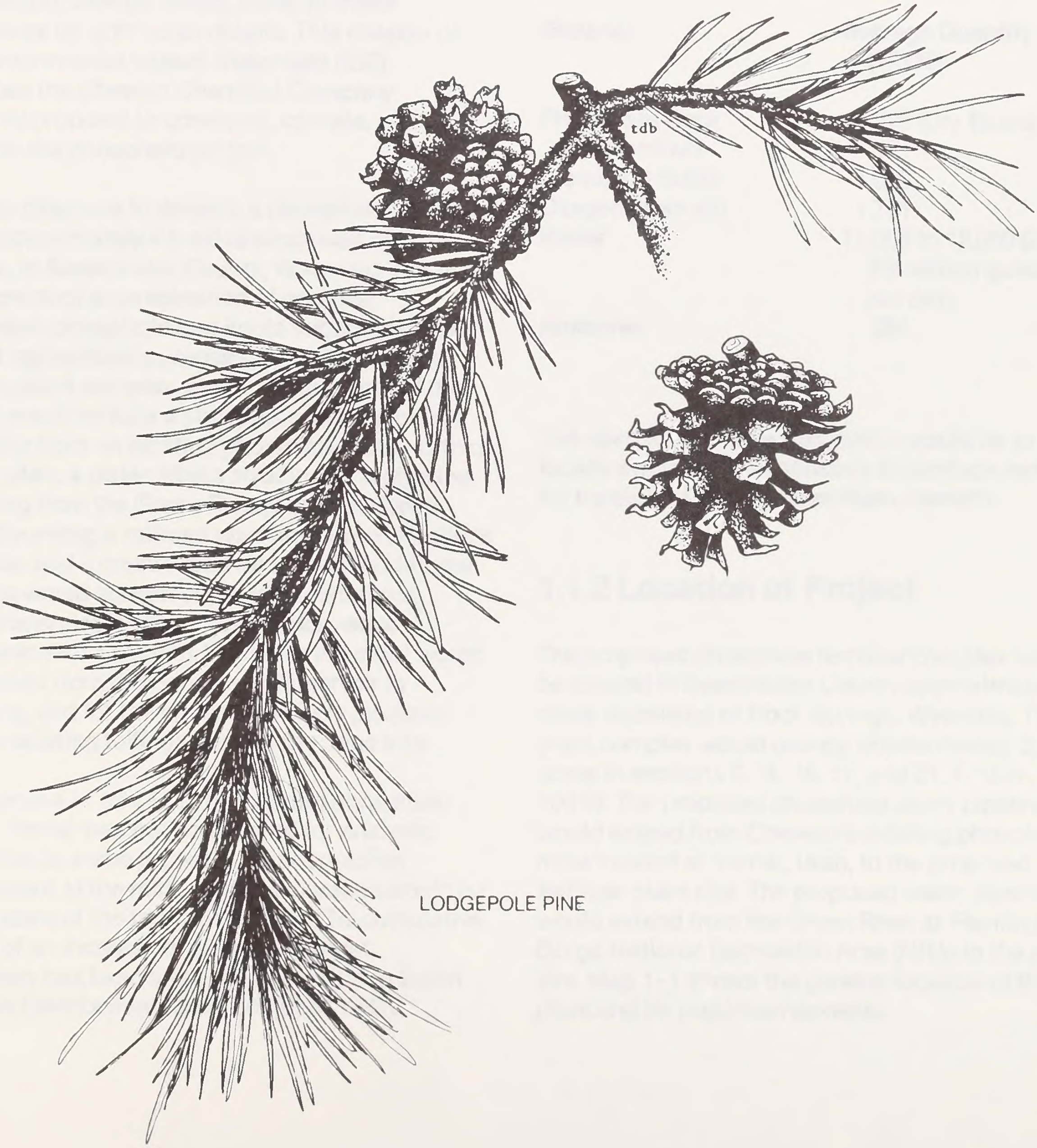
- Fertilizer Plant - Proposal;
- Phosphate Slurry Pipeline - MAPCO alternative;
- Slurry Water Supply - Proposal;
- Plant Process Water Supply - Middle Firehole alternative.

(However, if water from the Big Sandy Unit, Colorado River Quality Improvement Program, becomes available prior to construction, this alternative would be preferred.);

- Railroad Spur - Proposal;
- Microwave System - Proposal;
- County Road Relocation - Proposal;
- Power Transmission Lines and Substations - as described for the agency preferred alternatives and as proposed for the plant complex

CHAPTER I

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES



LODGEPOLE PINE

CHAPTER 1
DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

1.1 INTRODUCTION

The material in this chapter describing the proposed action and the slurry and water pipeline alternatives has been summarized from the Project Description, Chevron Phosphate Project, Sweetwater County, Wyoming (Chevron 1982a); the Wyoming Industrial Siting Council Permit Application for the Chevron Phosphate Project, Sweetwater County, Wyoming (Chevron 1982b); and the Chevron responses to questions regarding their application (Chevron 1982c). Refer to these documents for additional details. This chapter of the Environmental Impact Statement (EIS) describes the Chevron Chemical Company (Chevron) proposal to construct, operate, and maintain the phosphate project.

Chevron proposes to develop a phosphate fertilizer plant approximately 4.5 miles southeast of Rock Springs, in Sweetwater County, Wyoming. The plant would produce a combination of granular ammonium phosphate and liquid superphosphoric acid for agricultural purposes. In addition to the fertilizer plant complex, major components of the project would include a phosphate slurry pipeline extending from an existing phosphate mine north of Vernal, Utah; a water intake structure and pipeline extending from the Green River, south of Green River, Wyoming; a railroad spur from Union Pacific's main line; and a county road relocation. Additional facilities would consist of power substations, power transmission lines, and a microwave communications system. Water for the plant would be supplied from the Fontenelle Reservoir in Wyoming, and for the phosphate slurry pipeline, from an existing tailings pond at the mine site.

For purposes of this EIS, the existing phosphate mine in Vernal was not considered for analysis. There may be some increase in construction employment at the mine, but this increase would be independent of the fertilizer project. The cumulative impact of an increase of eight permanent employees has been analyzed in the Uintah Basin Synfuels Development draft EIS (BLM 1982).

1.1.1 Purpose and Need of the Proposed Action

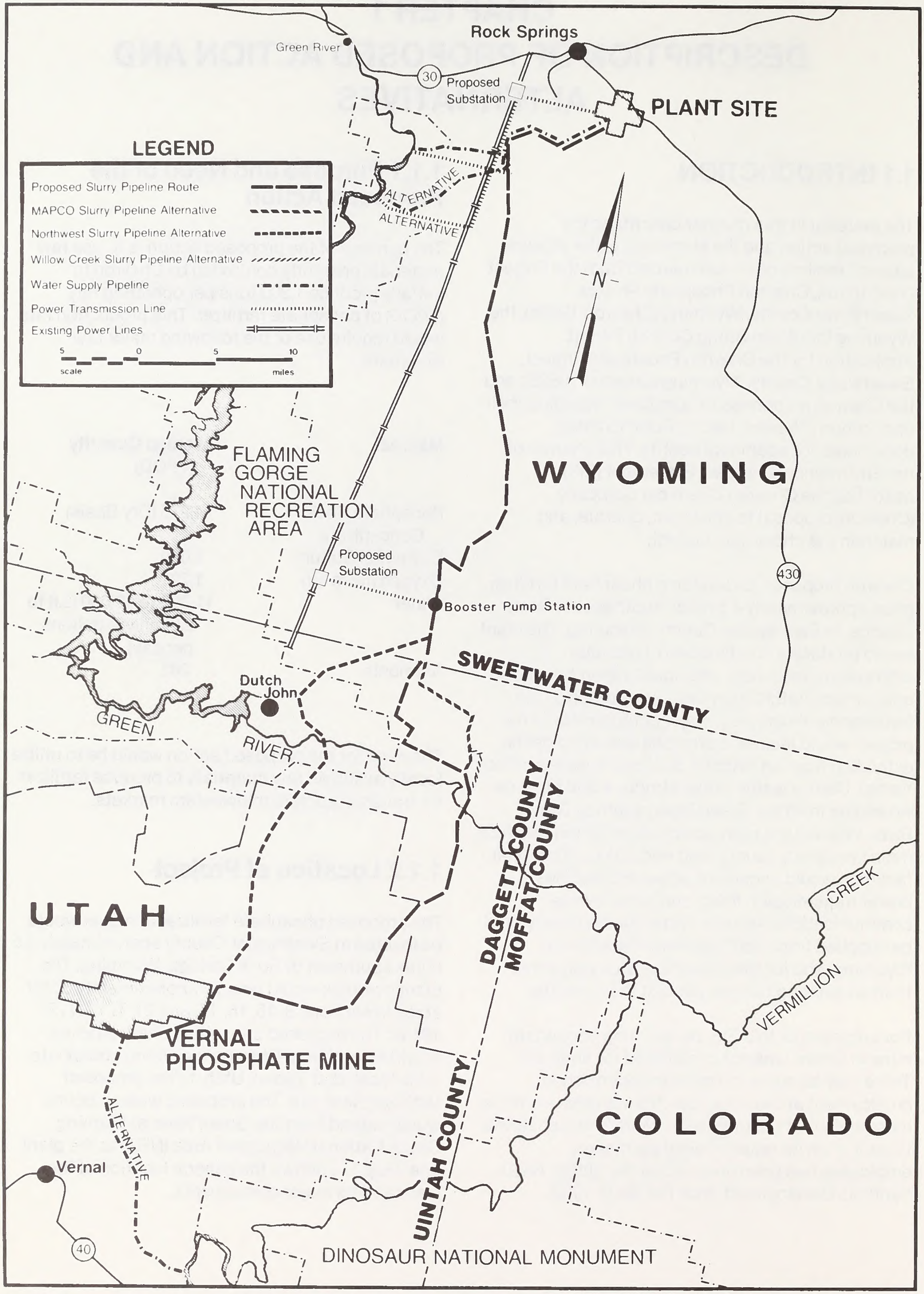
The purpose of the proposed action is to use raw materials presently controlled by Chevron to initially produce 1,200 tons per operating day (TPOD) of phosphate fertilizer. This production rate would require use of the following major raw materials:

Material	Average Quantity (TPOD)
Phosphate Rock Concentrate	4,275 (Dry Basis)
Elemental Sulfur	1,000
Oxygen (from air)	1,791
Water	11,000 to 12,000 (2.6 to 2.9 million gallons per day)
Ammonia	281

The need for the proposed action would be to utilize locally available raw materials to produce fertilizer for transportation to midwestern markets.

1.1.2 Location of Project

The proposed phosphate fertilizer complex would be located in Sweetwater County approximately 4.5 miles southeast of Rock Springs, Wyoming. The plant complex would occupy approximately 3,200 acres in sections 9, 15, 16, 17, and 21, T. 18 N., R. 104 W. The proposed phosphate slurry pipeline would extend from Chevron's existing phosphate mine located at Vernal, Utah, to the proposed fertilizer plant site. The proposed water pipeline would extend from the Green River at Flaming Gorge National Recreation Area (NRA) to the plant site. Map 1-1 shows the general location of the plant and its major components.



MAP 1-1 GENERAL LOCATION OF CHEVRON PHOSPHATE PROJECT

1.1.3 Authorizing Actions

The proposal would require federal authorization for rights-of-way for a phosphate slurry pipeline, water supply pipeline, railroad spur, county road relocation, power transmission lines, power substations, microwave facilities, and access roads. Approval of the Fontenelle water contract between the State of Wyoming and Chevron would also be required. State action for the proposal would require authorization for construction of the plant complex which would be located on private land.

The types of permits, approvals, and other authorizing actions required for construction and operation of the Chevron Phosphate Project are indicated in Tables 1-1 through 1-3. Appendix 2 identifies the general measures that will be attached to any of the federal right-of-way grants. Authorizations would be required from federal, state, and county agencies. Additional permits, which may be required if the Jensen Slurry Water Supply Alternative were chosen, include a 404 permit from the U.S. Army Corps of Engineers and approval from the Utah and Colorado State Engineers.

TABLE 1-1
MAJOR FEDERAL AUTHORIZING ACTIONS

Agency	Nature of Action	Authority	Project Feature
DEPARTMENT OF THE INTERIOR			
Bureau of Land Management (Rock Springs District/Vernal District)	Grant rights-of-way	Title V of Federal Land Policy and Management Act of 1976, 43 U.S.C. Section 1761-1771; CFR Part 28; Section 28 of the Mineral Leasing Act; 30 U.S.C.Section 185; 43 CFR Part 2880	Corridor facilities; access roads, power transmission lines, water supply lines, phosphate slurry pipeline, substations, rail spurs, microwave towers
	Issue temporary use permits	Title V of Federal Land Policy and Management Act of 1976; Section 28 of the Mineral Leasing Act of 1920	Temporary construction activities
	Issue materials sales contract	Materials Act of July 31, 1947, as amended, 30 U.S.C. 601, 602, 43 CFR 3600	Aggregate for road construction
Bureau of Reclamation	Grant special land use license or easement	Reclamation Projects Act of August 4, 1939, 35 Stat. 1189, and Section 10	Water pipeline, access roads, power transmission line, pump station (Davis Bottom)

TABLE 1-1
MAJOR FEDERAL AUTHORIZING ACTIONS (continued)

Agency	Nature of Action	Authority	Project Feature
	Approval of water contract	Colorado River Storage and Participating Projects Act, April 11, 1956, CH 203, 70 Stat. 105	Water sale between State of Wyoming and Chevron Chemical Company
National Park Service Office of the Departmental Consulting Archaeologist	Issue antiquities or archaeological resource permit to excavate or remove archaeological resources on Public Lands administered by BLM	Antiquities Act of 1906, 16 U.S.C. Section 431-433; Archaeological Resource Protection Act of 1979, 16 U.S.C. Sections 470aa-470ll; 43 CFR Part 3	All project features
U.S. Fish and Wildlife Service	Review impact on threatened or endangered species of fish, wildlife, or plants	Section 7 of Endangered Species Act of 1973, 16 U.S.C. 1536; 50 CFR part 402	All project features
DEPARTMENT OF AGRICULTURE			
U.S. Forest Service (Ashley National Forest)	Issue special use permit for constructing rights-of-way and facilities	Title V of Federal Land Policy and Management Act of 1976; 43 U.S.C. Sections 1761-1771; Section 28 of the Minerals line, Leasing Act; 30 U.S.C. Section 185 etc.	Construction of access roads, phosphate slurry pipeline, power transmission line, water pipeline, pump station, water intake structure, microwave site, etc.
	Issue permit for borrow material	Materials Act; 30 U.S.C. Section 601, 602; 30 CFR Section 251.4	Aggregrate for road construction
	Issue antiquities or archaeological resource permit to excavate and remove archaeological resources on National Forest System Lands	Antiquities Act of 1906, 16 U.S.C. Sections 431-433; Archaeological Resource Protection Act of 1979, 16 U.S.C. Sections 470aa-470ll; 43 CFR Part 3	All project features

TABLE 1-1
MAJOR FEDERAL AUTHORIZING ACTIONS (continued)

Agency	Nature of Action	Authority	Project Feature
DEPARTMENT OF THE ARMY			
U.S. Army Corps of Engineers	Issue (Nationwide Permit Section 404) individual permit(s) for placement of dredged or fill material in waters of the United States	Section 404 of Federal Water Pollution Control Act Amendment of 1972, 33 U.S.C. Section 1344; 33 CFR Parts 323, 325	River or stream crossing for phosphate slurry pipeline, etc.
	Issue (Section 10) permit(s) for structures or work in or affecting navigable waters of the United States	Section 10 of the Rivers and Harbor Act of 1899; 33 U.S.C. 403; 33 CFR Parts 320-322, 329	Water diversion facilities, pump-station, and construction resulting in alterations to water course on the Green River
FEDERAL COMMUNICATIONS COMMISSION	License to operate industrial radio service	Section 303 of Communications radio service Act of 1934, 47 U.S.C. Section 303; 47 CFR Parts 90, 94	Communications, microwave towers
DEPARTMENT OF TRANSPORTATION			
Federal Highway Administration	Issue permit(s) to cross Federal-aid highways	23 U.S.C. Sections 116, 123, 315; 23 CFR Part 645 Subpart B	Water pipelines, phosphate slurry pipeline, access roads
Federal Aviation Administration	Issue air space permit for air-related air space determination and air space obstruction clearance for project facilities	Section 1101 of the Federal Aviation Act of 1958, 49 U.S.C. Section 1501; 14 CFR Part 77	Stacks at processing plants and other facilities; microwave towers
Research and Special Programs Administration Office of Operations and Enforcement	Regulates safe construction and operation of pipelines	18 U.S.C. Section 834; 49 U.S.C. Section 1655;49 CFR Part 195	Pipelines

TABLE 1-1
MAJOR FEDERAL AUTHORIZING ACTIONS (concluded)

Agency	Nature of Action	Authority	Project Feature
DEPARTMENT OF LABOR			
Occupational Safety and Health Administration	Inspect and approve surface construction for worker safety	Occupational Safety and Health Act of 1970, 29 U.S.C. Sections 651 et seq.; 29 CFR Part 2200	Construction at the processing plants and ancillary facilities

TABLE 1-2
MAJOR STATE AUTHORIZING ACTIONS

Agency	Nature of Action	Authority	Project Feature
COLORADO			
STATE ENGINEER'S OFFICE	Approval of 3,000-acre-feet appropriation of water	Modification of the Upper Colorado River Compact; Colorado Revised Statute Title 37-67-101; approval of all five Colorado General Assemblies; and amending the Congressional Consent to Compact Act of 1949 (63 Statute 31)	Jensen Slurry Water Supply Alternative
WYOMING			
DEPARTMENT OF ENVIRONMENTAL QUALITY			
Air Quality Division	Issue air quality construction permit	Wyoming Environmental Quality Act, W.S. 35-502-101 through 35-502-1207	Plant complex construction
	Issue air quality operation permit	Wyoming Environmental Quality Act, W.S. 35-502-101 through 35-502-1207	Plant complex emissions during operation

TABLE 1-2 (Continued)
MAJOR STATE AUTHORIZING ACTIONS

Agency	Nature of Action	Authority	Project Feature
	Issue prevention of significant deterioration permit for phosphate plant stack emmissions	Clean Air Act of 1977, as amended (43 U.S.C. 1701; 40 CFR 42.21)	Plant complex emissions
Water Quality Division	Issue permit to construct, install, or modify public water supplies and wastewater facilities	Wyoming Environmental Quality Act, W.S. 35-11-301	Plant Complex
	Issue permit to construct sediment control structures	Wyoming Environmental Quality Act, W.S. 35-11-301	Plant Complex
	Approval of wastewater evaporation pond and gypsum pond	Wyoming Environmental Quality Act, W.S. 35-11-301	Plant Complex
	Approval of sewage treatment plant (ground water pollution control permit)	Wyoming Environmental Quality Act, W.S. 35-11-301	Plant Complex
	Approvial of water supply for plant personnel	Wyoming Environmental Quality Act, W.S. 35-11-301 (a)(v) and 35-II-302	Plant Complex
WYOMING STATE ENGINEER'S OFFICE	Approval for construction or enlargement of reservoir		Plant Complex
	Approval of change of use and point of diversion - inundated rights		Plant Complex

TABLE 1-2 (Continued)
MAJOR STATE AUTHORIZING ACTIONS

Agency	Nature of Action	Authority	Project Feature
	Review of water supply and water yield analysis		Plant Water Supply
	Issue permits to appropriate ground water, statement of completion, and description of well		Plant Complex
	Approval of water pipeline		Plant Complex
	Issue reservoir permit - raw water holding pond		Plant Complex
	Issue reservoir permit - wastewater evaporation pond. Issue temporary water rights for construction; permits to appropriate surface water		Plant Complex
WYOMING STATE HIGHWAY DEPARTMENT	Permits for oversize and overweight loads	Chapters 17 and 20 of the Wyoming Department of Highways Rules and Regulations	Construction material and equipment utilizing state highways
	Encroachment permits	Chapter 12 of the Wyoming Department of Highways Rules and Regulations	Pipelines, transmission lines, and access roads crossing state highways

TABLE 1-2 (Continued)
MAJOR STATE AUTHORIZING ACTIONS

Agency	Nature of Action	Authority	Project Feature
WYOMING INDUSTRIAL SITING ADMINISTRATION	Issue Industrial Facility Siting permit	Wyoming Industrial Development and Siting Act W.S. 35-12-101 through 35-12-121; Wyoming 1975 Session Laws, Chapter 169, as amended 1977, and 1981.	Plant complex/ wastewater evaporation pond
WYOMING STATE LAND BOARD	Issue easements to cross state lands		Pipelines (water and phosphate slurry), power transmission lines, access roads, etc.
WYOMING PUBLIC SERVICE COMMISSION	Certificate of Public Convenience and Necessity	Wyoming Statutes 1977 and Wyoming Administrative Procedure Act, W.S. 37-1-101, 37-1-102, 37-2-116, 37-2-117, 37-2-119, 37-2-120, 37-2-122, 37-2-205 through 207, 37-2-210 through 212, 37-3-114, 37-6-101 through 107	Rail spur
WYOMING DEPARTMENT OF ECONOMIC PLANNING	Approval of economic planning and development		Plant complex, pipelines, and utilities
WYOMING WATER DEVELOPMENT COMMISSION	Approval of water development		Wells, gathering system, plant complex and utilities
WYOMING FIRE MARSHALL	Approval of building plans		Plant complex

TABLE 1-2 (continued)
MAJOR STATE AUTHORIZING ACTIONS

Agency	Nature of Action	Authority	Project Feature
WYOMING STATE HISTORICAL PRESERVATION OFFICER	Archaeological and historical clearance		Plant complex, pipelines, access roads, utilities
UTAH			
DEPARTMENT OF NATURAL RESOURCES AND ENERGY			
Division of State Lands	Grant rights-of-way	Utah Code Annotated Section 65-2-1 (1978)	Corridor facilities, access roads, water supply pipeline
Division of Water Rights	Permits to construct diversion facilities or change place or nature of use of an existing water right	Utah Code Annotated Section 73-3-3 (1981)	Water diversion facilities (Jensen Alternative)
	Certificate to appropriate water	Utah Code Annotated Section 73-3-1 to 29 (1981)	Use of previously unappropriated water (Jensen Alternative)
	Approve plans and specifications for construction or repair of dams	Utah Code Annotated Section 73-3-5 (1981)	Construction of any impoundment dam (Jensen Alternative)
	Approval of plan to alter natural stream	Utah Code Annotated Section 73-3-29 (1981)	Alteration of a natural stream (Jensen Alternative)
Division of Forestry and Fire Control	Burning permit during closed fire season	Utah Code Annotated Section 24-2-12 (1976)	Burning of slash and waste

TABLE 1-2 (concluded)
MAJOR STATE AUTHORIZING ACTIONS

Agency	Nature of Action	Authority	Project Feature
UTAH DEPARTMENT OF DEVELOPMENT SERVICES			
Division of State History	Issue permit to survey or disturb archaeological or paleontological site on state land	Utah Code Annotated Section 63-18-25 (1978)	Phosphate pipeline, Jensen water supply pipeline, access roads, etc.
	Review impact on historical or cultural sites on or eligible for National Register of Historic Places	Section 106 of National Historical Preservation Act of 1966, 16 U.S.C. Section 470f; 36 CFR Part 800	Phosphate pipeline, Jensen water supply pipeline, access roads, etc.
UTAH DEPARTMENT OF TRANSPORTATION	Issue encroachment permits	Utah Code Annotated Section 27-12-11 (1976)	State and federal highway crossings
Highway Patrol	Issue overweight truck permits for delivery of materials for pipeline construction	Utah Code Annotated Section 27-12-155 (1976)	Delivery of materials
UTAH DEPARTMENT OF HEALTH, DIVISION OF ENVIRONMENTAL HEALTH			
Bureau of Air Quality	Issue open burning permit	Utah Code Annotated Section 26-13-6(1) (Supp. 1981)	Burning of slash and waste material
UTAH STATE ENGINEER'S OFFICE	Issue permit to appropriate water	Utah Code Annotated Section 73-3-1 to 29 (1968)	Phosphate slurry pipeline
UTAH INDUSTRIAL COMMISSION			
Division of Occupational Safety and Health	Inspect construction for worker safety	Utah Code Annotated Sections 35-91 *et seq.* (1974)	Surface processing facilities downstream of pyrolysis units

TABLE 1-3
MAJOR COUNTY AUTHORIZING ACTIONS

Agency	Nature of Action	Authority	Project Feature
SWEETWATER COUNTY (Wyoming)	Approval of applications to cross county roads	County Commission by resolution	Railroad, phosphate slurry pipeline, water pipeline
	Zoning permits (construction or alteration permit, and conditional use permit)	Section 185201-185207; Wyoming Statutes Annotated 1977, republished edition	Railroad and any structure over 96 square feet; phosphate slurry pipeline, water pipeline, substations
	Permit to relocate County Road 4-27	County Commission	County road relocation
UINTAH COUNTY (Utah)	Issue building permits	Uintah County Zoning Ordinance	Pump station for Jensen water supply pipeline
	Issue temporary use permits	Uintah County Zoning Ordinance	Temporary construction of any offices or sheds
	Issue extraction of earth products permit	Uintah County Zoning Ordinance	Borrow area(s)
DAGGETT COUNTY (Utah)	Issue building permit	Daggett County Zoning Ordinance	Phosphate slurry pipeline

1.1.4 Interrelationships

Other Proposed or Existing Projects

In recent years, Sweetwater County experienced substantial growth in mineral and industrial developments. The major industrial activities in the county are concentrated in the trona fields west and northwest of Green River and in the coal fields east and northeast of Rock Springs. Construction of Tenneco's trona mine and processing facilities was recently completed but the proposed Texasgulf trona mine expansion has been delayed indefinitely. Uranium mining is concentrated in the eastern portion of Sweetwater County, whereas oil and gas development activities are scattered throughout the county. The major oil and gas fields are located between Wamsutter and South Superior near U.S. Interstate Highway 80. The Jim Bridger power plant is located east of Rock Springs.

Other activities and appurtenant components to major industrial developments which taken together, have constituted a substantial cumulative effect on the county, include numerous oil, gas, and water pipelines, rail spurs, access roads, and utility lines. Several pipelines have recently been constructed in the county including the Trailblazer Interstate Gas Pipeline located north of Chevron's proposed fertilizer plant and the Mountain Fuel Pipeline which parallels the Mid-America Pipeline Company (MAPCO) pipeline from Clay Basin to approximately 1 mile south of U.S. Interstate Highway 80.

No major proposed industrial developments are expected to coincide with construction of the Chevron project. Retrofit scrubber installation on Unit 3 at the Jim Bridger power plant will begin in 1984 and require over 200 additional workers. The general slowing of mineral and industrial growth in the county is expected to continue through the proposed Chevron project construction period.

Special Management Areas

Four special management areas (Map 1-2, located inside the back cover pocket) could be affected by project components and alternatives: the Green River Corridor Area of Critical Environmental Concern (ACEC), the Red Creek Watershed ACEC, the Red Creek Badlands Wilderness Study Area (WSA), and Flaming Gorge NRA. Portions of the Green River located in Utah and Colorado are being studied for potential designation under the Wild and Scenic Rivers system. The Red Creek Watershed ACEC overlapping to the Utah/Wyoming border, is a critical watershed area. A portion of this ACEC located in Wyoming is being considered for proposed wilderness designation. The Flaming Gorge NRA, which is administered by the U.S. Forest Service, is located along the western edge of the project area. The West Cold Springs WSA is located on the Utah/Colorado border; however, because of its distance from the proposed route or any alternative, it would not be affected and, therefore, is not analyzed further in this EIS.

1.2 HISTORY AND BACKGROUND

Phosphate rock and sulfur are the basic raw materials required to manufacture phosphate fertilizer. Sulfur for the proposed plant would be provided by the Chevron USA Carter Creek gas treatment plant located near Kemmerer, Wyoming, which produces sulfur as a byproduct. Phosphate rock would be provided by the Chevron phosphate mine located near Vernal, Utah. This mine was purchased from the Stauffer Chemical Company by Chevron Resources in 1981. Following purchase of the Vernal mine, Chevron began a selection process to locate a site for the fertilizer facility. Rock Springs, Wyoming, was selected as the most desirable and environmentally preferred site.

Chevron has submitted applications to the State of Wyoming for an Industrial Siting Permit (July 1982), Prevention of Significant Deterioration (PSD) Permit (August 1982), and is in the process of submitting applications for various other state permits. Water for use at the fertilizer plant was purchased from the State of Wyoming in February 1982. The contract allows Chevron to purchase water up to a maximum of 22,500 acre-feet per year (State of Wyoming 1982). The water supply for the project was approved by the Wyoming State Engineer in May 1982. The Wyoming State Legislature approved the transportation of up to 3,000 acre-feet per year of water into Utah for use in the phosphate slurry pipeline. The Utah State Engineer has authority to approve the water diversion into Utah. In March 1982, the Sweetwater County Commissioners approved the zoning change for the proposed plant site from agriculture to heavy industry.

Chevron has an option agreement with the Rock Springs Grazing Association to purchase four sections (9, 15, 17, and 21) in T. 18 N., R. 104 W., for the plant complex. Chevron also obtained a special use permit for section 16, T. 18 N., R. 104 W., in April 1982. This permit allows Chevron to use section 16 until it can be purchased from the State of Wyoming.

In November 1981, an air quality monitoring station was installed on the plant site. In April 1982, a right-of-way permit to construct a 13.5-kilovolt (kV) power transmission line to the plant site was obtained from the Bureau of Land Management (BLM). As part of a water resources inventory program conducted on the site, Chevron obtained appropriate permits from the Wyoming State Engineer and the BLM to complete the drilling of three wells on public land. On May 7, 1982, Chevron submitted a right-of-way application to the BLM for construction of the phosphate slurry pipeline, railroad spur, plant process water pipeline, and pump station. Right-of-way applications for the microwave stations, county road relocation and access roads are still necessary as is an application from Pacific Power and Light Company (PP&L) for the power transmission lines and two power substations.

1.3 OVERVIEW OF THE PROPOSED ACTION AND ALTERNATIVES

1.3.1 General Description

The Chevron Phosphate Project would utilize phosphate rock from the existing mine and beneficiation plant located north of Vernal, Utah. The phosphate rock concentrate would be slurried to the Rock Springs plant site complex *via* an approximate 98.2-mile long, 11-inch diameter pipeline, and treated at the 3,200-acre plant site to produce 157,000 tons of 68 percent superphosphoric acid and 534,000 tons per year of granulated ammonium phosphate fertilizer. Water required for the project would be supplied from the Fontenelle Reservoir.

The proposed project would consist of the following components:

- 5.6 million tons of phosphate per year from existing phosphate mine
- 85-acre existing mine tailings pond (slurry water supply)
- 98.2-mile long, 11-inch diameter phosphate slurry pipeline with an initial and booster pump station
- 3,200-acre plant complex site including
  - Sulfuric acid plant
  - Dry rock concentrate facilities
  - Phosphoric acid plant
  - Superphosphoric acid plant
  - Ammonium phosphate plant
  - Storage tanks
  - Office, warehouse, and storage facilities
  - Gypsum impoundment
  - Sewage treatment facilities
- 16.4-mile long plant process water pipeline with a water intake structure, pump station, and access road
- 1.6-mile long county road relocation
- 8.7-mile long railroad spur
- 24 miles of power transmission lines
- 2 power substations
- 4 microwave repeater stations and 4 terminal station communication facilities

The overall project schedule as submitted by Chevron is shown in Figure 1-1. The estimated time required from start of construction to initial production would be 2.5 years.

In addition to the proposed action, the following alternatives are analyzed: (1) system alternative—No-Action Alternative and (2) component alternatives—Middle Firehole Plant Process Water Pipeline Alternative with access road, power transmission line, intake structure, and pump station; Jensen Slurry Water Supply Alternative; Big Sandy Unit, Colorado River Water Quality Improvement Program Alternative; MAPCO, Northwest, and Willow Creek Phosphate Slurry Pipeline Alternatives with power transmission line, and initial and booster pump stations.

Based on design and operational and economic parameters, the construction of the phosphate slurry pipeline would be limited to a maximum grade of 15 percent (Chevron 1981). This grade limitation restricts the location of the proposed slurry pipeline.

The life expectancy of the project is difficult to predict since it is anticipated that minor adaptation to technological changes and changes in market demand for different types of fertilizers would keep the plant from becoming obsolete. For the purpose

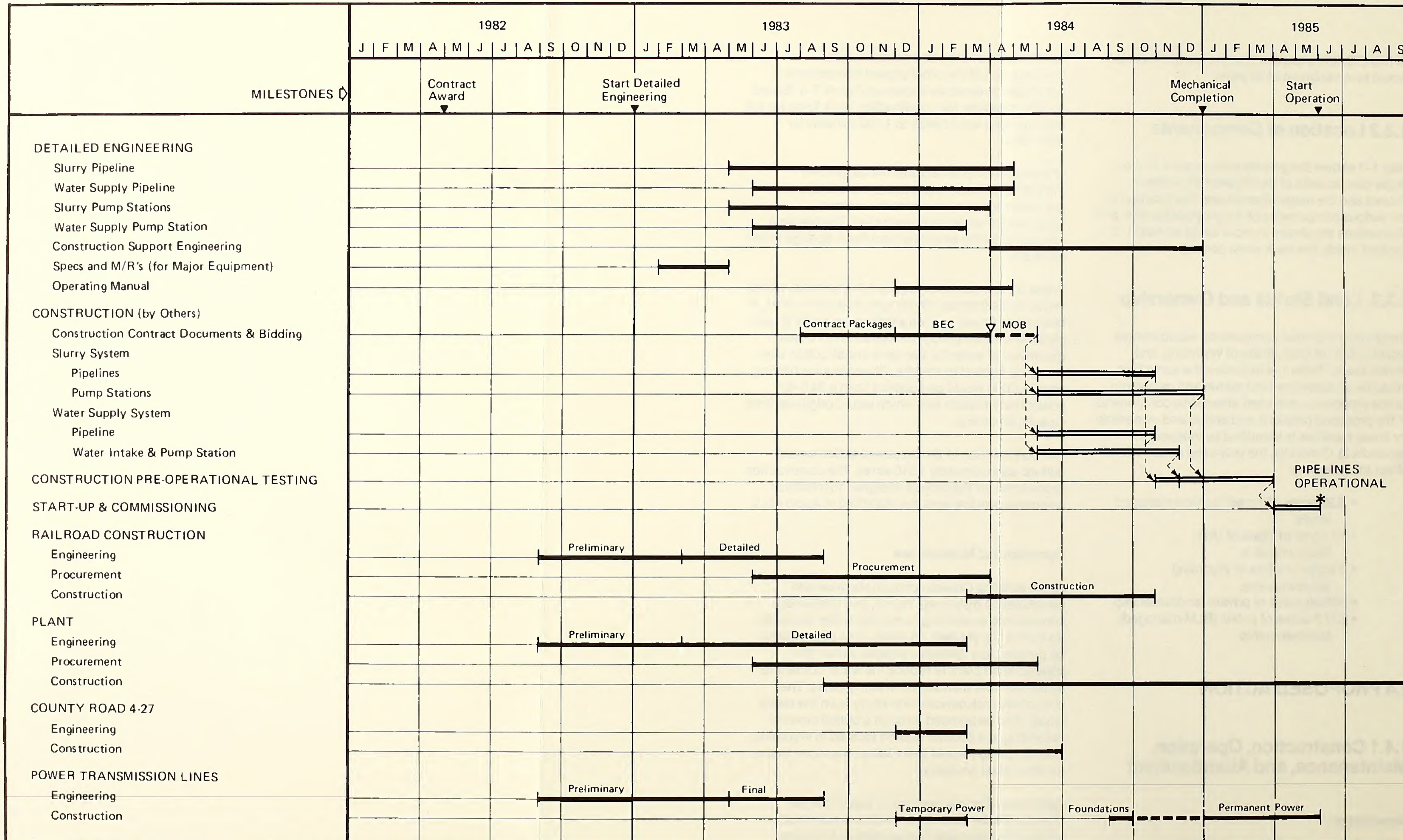


FIGURE 1-1 CHEVRON PHOSPHATE PROJECT SCHEDULE

LEGEND
- Engineering Activity
- Construction Activity
- ▽ Purchase Order or Contract Award
- BEC Receive and Evaluate Bids and Commit
- MOB Mobilization

SOURCE: CHEVRON

of this EIS, it is assumed that the life of the project would be a minimum of 30 years.

1.3.2 Location of Components

Map 1-1 shows the general arrangement of the major components of the Chevron Phosphate Project and the major alternatives. The location of the various components of the proposed action and alternatives are shown in more detail on Map 1-2 (located inside the back cover pocket)

1.3.3. Land Status and Ownership

The proposed project components would involve federal, State of Utah, State of Wyoming, and private lands. Table 1-4 indicates the acres that would be disturbed by land status and ownership for the proposed action and alternative components of the proposed project (Land status and ownership for linear facilities is identified by milepost in Appendix 3). Generally, the proposed action would affect the following:

- 5.25 acres of Forest Service-managed lands
- 11 acres of State of Utah landownership
- 6 acres of State of Wyoming landownership
- 976.25 acres of private landownership
- 517.5 acres of public (BLM-managed) landownership

1.4 PROPOSED ACTION

1.4.1 Construction, Operation, Maintenance, and Abandonment

Construction

The proposed construction sequence would begin with plant and site preparation and then construction of the plant process units. Construction of the other project components is scheduled to occur as shown on Figure 1-1. Based on this schedule, the construction work force for the entire project would peak at 1,100 persons by mid-1984.

Construction of the facilities would involve movement of heavy equipment, materials, and personnel to the sites where the various components would be constructed. The heaviest amount of traffic would be from Rock Springs to the plant site.

Water for the plant site required during construction would come from an on-site ground water source, if one can be found, or from a temporary water supply pipeline extending from the Green River. Small quantities of water for the other construction sites would be trucked to the site. Power required during construction would be supplied from a 34.5-kV power transmission line which would originate from Quealy, Wyoming.

The construction of the proposed action would disturb approximately 1,516 acres. The construction procedures for the project designed to minimize environmental impacts are identified in Appendix 2

Operation and Maintenance

At the existing Chevron phosphate mine and beneficiation plant near Vernal, phosphate rock concentrate would be ground with water to reduce its size to 100 percent -48 mesh. This slurry would be pumped to a thickener located within the beneficiation plant to reduce the water content to 40 percent and then stored in slurry tanks. The phosphate rock concentrate slurry from the tanks would then be pumped through a buried pipeline extending to a booster station located in Wyoming. Booster pumps would then deliver the slurry to the fertilizer plant complex

Sulfur would be transported by train from the Chevron Carter Creek gas treatment plant sulfur terminal in Kemmerer to the proposed fertilizer plant complex. Approximately 1,000 tons per operating day (TPOD) of elemental sulfur would be

TABLE 1-4
ACRES DISTURBED BY LAND STATUS AND OWNERSHIP FOR THE PROPOSED ACTION AND ALTERNATIVES

Component	Forest Service Miles	Forest Service Acres	Utah Miles	Utah Acres	Wyoming Miles	Wyoming Acres	Private Miles	Private Acres	BLM Miles	BLM Acres	Total Miles	Total Acres
PROPOSED ACTION												
Plant Complex												
Plant	--	--	--	--	--	--	NA	530.0.	--	--	NA	530.0
Power Substation	--	--	--	--	--	--	NA	1.0	--	--	NA	1.0
Power Transmission Line	--	--	--	--	--	--	4.7	11.0	2.3	6.0	7.0	17.0
Railroad Spur	--	--	--	--	--	--	4.5	82.0	4.2	77.0	8.7	159.0
County Road Relocation	--	--	--	--	--	--	1.4	25.0	0.2	4.0	1.6	29.0
Component Total:	--	--	--	--	--	--	10.6	649.0	6.7	87.0	17.3	736.0
Davis Bottom Plant Process Water Pipeline:												
Pipeline	0.2	2	--	--	0.5	2.0	9.6	60.0	6.1	36.0	16.4	100.0
Access Road	0.2	1	--	--	--	--	2.3	7.0	2.5	7.0	5.0	15.0
Power Transmission Line	0.2	1	--	--	0.8	2.0	4.0	10.0	5.0	11.0	10.0	24.0
Pump Station	NA	1	--	--	--	--	--	--	--	--	NA	1.0
Component Total:	0.6	5	--	--	1.3	4.0	15.9	77.0	13.6	54.0	31.4	140.0
Red Creek Phosphate Slurry Pipeline:												
Segment A[1]	--	--	1.7	11.0	--	--	23.6	150.0	27.1	171.0	52.4	332.0
Segment B[2]	--	--	--	--	--	--	16.0	100.0	29.8	185.0	45.8	285.0
Booster Pump Station	--	--	--	--	--	--	--	--	NA	3.0	NA	3.0
Power Substation	--	--	--	--	--	--	--	--	NA	1.0	NA	1.0
Power Transmission Line	--	--	--	--	1.0	2.0	--	--	6.5	16.0	7.5	18.0
Microwave System	NA	0.25	--	--	--	--	NA	0.25	NA	0.5	NA	0.1
Component Total	--	0.25	1.7	11.0	1.0	2.0	39.6	250.25	63.4	376.5	105.7	640.0
Slurry Water Supply (Tailings Pond)[3]	--	--	--	--	--	--	NA	0	--	--	--	--
Proposed Action Total:	0.6	5.25	1.7	11.0	2.3	6.0	66.1	976.25	83.7	517.5	154.4	1,516.0

TABLE 1-4 (continued)
ACRES DISTURBED BY LAND STATUS AND OWNERSHIP FOR THE PROPOSED ACTION AND ALTERNATIVES

Component	Forest Service Miles	Forest Service Acres	Utah Miles	Utah Acres	Wyoming Miles	Wyoming Acres	Private Miles	Private Acres	BLM Miles	BLM Acres	Total Miles	Total Acres
ALTERNATIVES												
Middle Firehole Plant Process Water Pipeline Alternative												
Pipeline	0.7	4.0	--	--	--	--	11.8	72.0	7.9	48.0	20.4	124.0
Access Road	0.7	2.0	--	--	--	--	3.6	11.0	3.7	11.0	8.0	24.0
Power Transmission Line	0.7	2.0	--	--	--	--	6.0	14.0	7.3	18.0	14.0	34.0
Pump Station	NA	1.0	--	--	--	--	--	--	--	--	NA	1.0
Alternative Total:	2.1	9.0	--	--	--	--	21.4	97.0	18.9	77.0	42.4	183.0
Jensen Slurry Water Supply Alternative												
Pipeline	--	--	1.7	10.0	--	--	2.8	18.0	14.5	88.0	19.0	116.0
Power Transmission Line	--	--	--	--	--	--	0.6	1.0	--	--	0.6	1.0
Pump Station	--	--	--	--	--	--	NA	1.0	--	--	NA	1.0
Alternative Total:	--	--	1.7	10.0	--	--	3.4	20.0	14.5	88.0	19.6	118.0
MAPCO Phosphate Slurry Pipeline Alternative												
Pipeline												
Segment A[1]	--	--	1.3	8.0	--	--	21.7	136.0	27.5	172.0	50.5	316.0
Segment B[2]	--	--	--	--	--	--	16.0	100.0	29.8	185.0	45.8	285.0
Booster Pump Station	--	--	--	--	--	--	--	--	NA	3.0	NA	3.0
Power Substation	--	--	--	--	--	--	--	--	NA	1.0	NA	1.0
Power Transmission Line	--	--	--	--	1.0	2.	--	--	6.5	16.0	7.5	18.0
Microwave System	NA	0.25	--	--	--	--	NA	0.25	NA	0.5	NA	1.0
Alternative Total:	--	0.25	1.3	8.0	1.0	2.0	37.7	236.25	63.8	377.5	103.8	624.0
Northwest Phosphate Slurry Pipeline Alternative												
Pipeline												
Segment A[1]	6.6[4]	42.0	0.8	5.0	1.1	7.0	17.6	113.0	16.2	105.0	42.3	272.0
Segment B[2]	--	--	--	--	--	--	16.0	100.0	29.8	185.0	45.8	285.0
Booster Pump Station	--	--	--	--	--	--	--	--	NA	3.0	NA	3.0
Power Substation	--	--	--	--	--	--	--	--	NA	1.0	NA	1.0
Power Transmission Line	--	--	--	--	1.0	2.0	--	--	6.5	16.0	7.5	18.0
Microwave System	NA	0.25	--	--	--	--	NA	0.25	NA	0.5	NA	1.0
Alternative Total:	6.6	42.25	0.8	5.0	2.1	9.0	33.6	213.25	52.5	310.5	95.6	580.0

TABLE 1-4 (concluded)
ACRES DISTURBED BY LAND STATUS AND OWNERSHIP FOR THE PROPOSED ACTION AND ALTERNATIVES

Component	Forest Service Miles	Forest Service Acres	Utah Miles	Utah Acres	Wyoming Miles	Wyoming Acres	Private Miles	Private Acres	BLM Miles	BLM Acres	Total Miles	Total Acres
Willow Creek Phosphate Slurry Pipeline Alternative												
Pipeline												
Segment A	--	--	3.0	19.0	--	--	21.2	132.0	26.8	168.0	51.0	319.0
Segment B	--	--	--	--	--	--	16.0	100.0	29.8	185.0	45.8	285.0
Booster Pump Station	--	--	--	--	--	--	--	--	NA	3.0	NA	3.0
Power Substation	--	--	--	--	--	--	--	--	NA	1.0	NA	1.0
Power Transmission Line	--	--	--	--	1.0	2.0	--	--	6.5	16.0	7.5	18.0
Microwave System	NA	0.25	--	--	--	--	NA	0.25	NA	0.5	NA	1.0
Alternative Total	--	0.25	3.0	19.0	1.0	2.0	37.2	232.25	63.1	373.5	104.3	627.0

[1] Segment A extends from the phosphate mine to the booster pump station.
[2] Segment B extends from the booster pump station to the plant site.
[3] Existing tailings pond, no additional disturbed acreage.
[4] 2.5 miles on National Recreation Area.
NOTE: This table indicates acres of disturbance, not right-of-way widths. Acreages are based on the type of construction and the nature of the terrain.

oxidized and absorbed to produce sulfuric acid. Approximately 4,275 TPOD of phosphate rock concentrate (dry basis) would then be mixed with the sulfuric acid to make phosphoric acid. The phosphoric acid would be filtered to remove gypsum and then it would be concentrated to 52 percent P_2O_5 by evaporation. A detailed description of the dihydrate process to be used in the fertilizer plant complex is provided in Section 2.2 of the Wyoming Industrial Siting Council Permit Application (Chevron 1982b). Under current plans, 134,000 tons per year (TPY) of the 52 percent phosphoric acid would be further concentrated by evaporation to 68 percent (superphosphoric acid P_2O_5) and shipped by rail directly to market. The remaining 254,000 TPY of 52 percent phosphoric acid produced at the plant would be reacted with approximately 75,000 TPY of ammonia to produce granulated ammonium phosphate fertilizer which would also be shipped by rail to market. Initial production from the plant would be 534,000 TPY (dry basis) of phosphate fertilizer.

General routine and non-routine operating procedures that would be followed by Chevron in order to reduce impacts are described in Appendix 2. Many features of design, construction, and operation of the pipeline would reduce the likelihood of a phosphate slurry spill. General spill response action guidelines to be followed in the event of a slurry spill are as follows:

- ***Determine need for cleanup.*** Since the phosphate rock concentrate is essentially inert, there may be cases where spill cleanup would result in more environmental damage than if the material were left in place. Consequently following a spill, Chevron will determine the need for cleanup collaborating with landowners and agencies having jurisdiction.
- ***Cleanup.*** Cleanup procedures would depend on the size and distribution of the

spill. In the case of a large spill concentrated in a small area, heavy equipment such as scrapers and front-end loaders would be used initially to pick up the bulk of the material. The cleanup would be finished manually. In the case of a small spill or a spill where material was spread in a thin layer over a large area, it may be necessary to conduct the entire cleanup operation manually.

- ***Determine need for restoration.*** Following cleanup, the need and specifications for restoration would be determined in collaboration with landowners and agencies having jurisdiction.

Abandonment

At project termination, all surface facilities associated with the plant complex, pump stations, and railroad spur would be removed and sold as salvage. Reclamation procedures that would be followed are described in Appendix 2

1.4.2 Components

Plant Complex

The plant complex would be located on a 3,200-acre parcel of private land approximately 4.5 miles southeast of Rock Springs. Map 1-3 shows the general location of the proposed plant facilities and other project components immediately adjacent to the plant site complex.

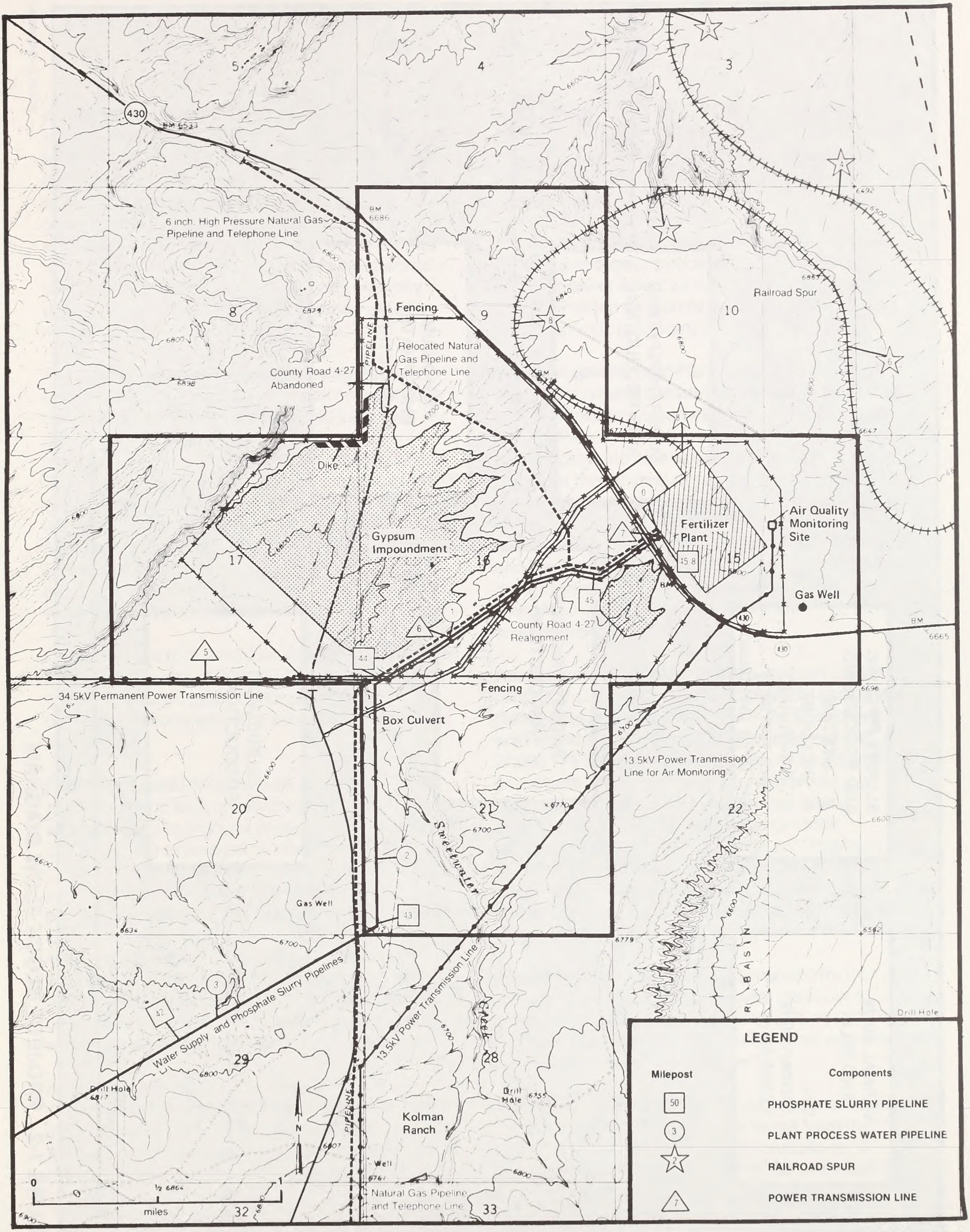
The process area of the proposed fertilizer plant complex would be located entirely within section 15, T. 18 N., R. 104 W. Wyoming State Highway 430 would bound the plant on the west side. A four-strand barbed wire fence similar to the Type III fence outlined in the Wyoming Department of Environmental Quality, Land Quality Division Guideline No. 10 (1981) would be used around the perimeter of the plant complex site (Map 1-3). A tall sheep-tight fence (Type II) would be installed around the perimeter of the gypsum impoundment. The actual plant processing area would be fenced with a chain link fence. Of the total plant complex site area, about 1,500 acres would be fenced.

Electrical power for the fertilizer plant would be supplied by way of a new 34.5-kV power transmission line extending from an existing 230-kV line, 7 miles west of the plant. The new power transmission line would parallel the new water supply and phosphate slurry pipeline right-of-way for the last 1.8 miles entering the plant.

The 120-acre process area of the fertilizer plant would comprise several units (subplants). Construction of all units is scheduled to begin in the spring of 1984 and be completed in late 1985. The construction work force for all facilities associated with the plant complex would peak at 900 in 1984. The operational work force would be approximately 386 and would remain constant. The operation of the phosphate project is described in detail in section 2.2 of the Wyoming Industrial Siting Council Permit Application (Chevron 1982b). Figure 1-2 provides a generalized overview of the entire process.

Approximately 4,300 railcars, annually, would deliver sulfur, ammonia, filter acid, caustic soda, miscellaneous chemicals, and general freight to the plant complex. Between 13,500 to 14,000 railcars, annually, would carry fertilizer products from the plant in 50- to 80-car long trains. Shipping would increase during March through May and September through December when the greatest demand for fertilizer exists. The shipment during these periods would average one train per day (two, maximum) travelling from 25 to 35 miles per hour.

Sulfuric Acid Plant: Molten sulfur, 1,000 TPOD (347,000 TPY), would be burned with dried air in the sulfuric acid plant to produce sulfur dioxide. A waste-heat boiler would produce high-pressure steam for generating electrical power, space, and process heating, and for driving process equipment. Cooled sulfur dioxide would be converted to sulfur trioxide in the presence of excess oxygen and a vanadium pentoxide catalyst. Heat recovered from this reaction would be used to preheat boiler feed water.



SOURCE: CHEVRON

MAP 1-3 PLANT COMPLEX AREA

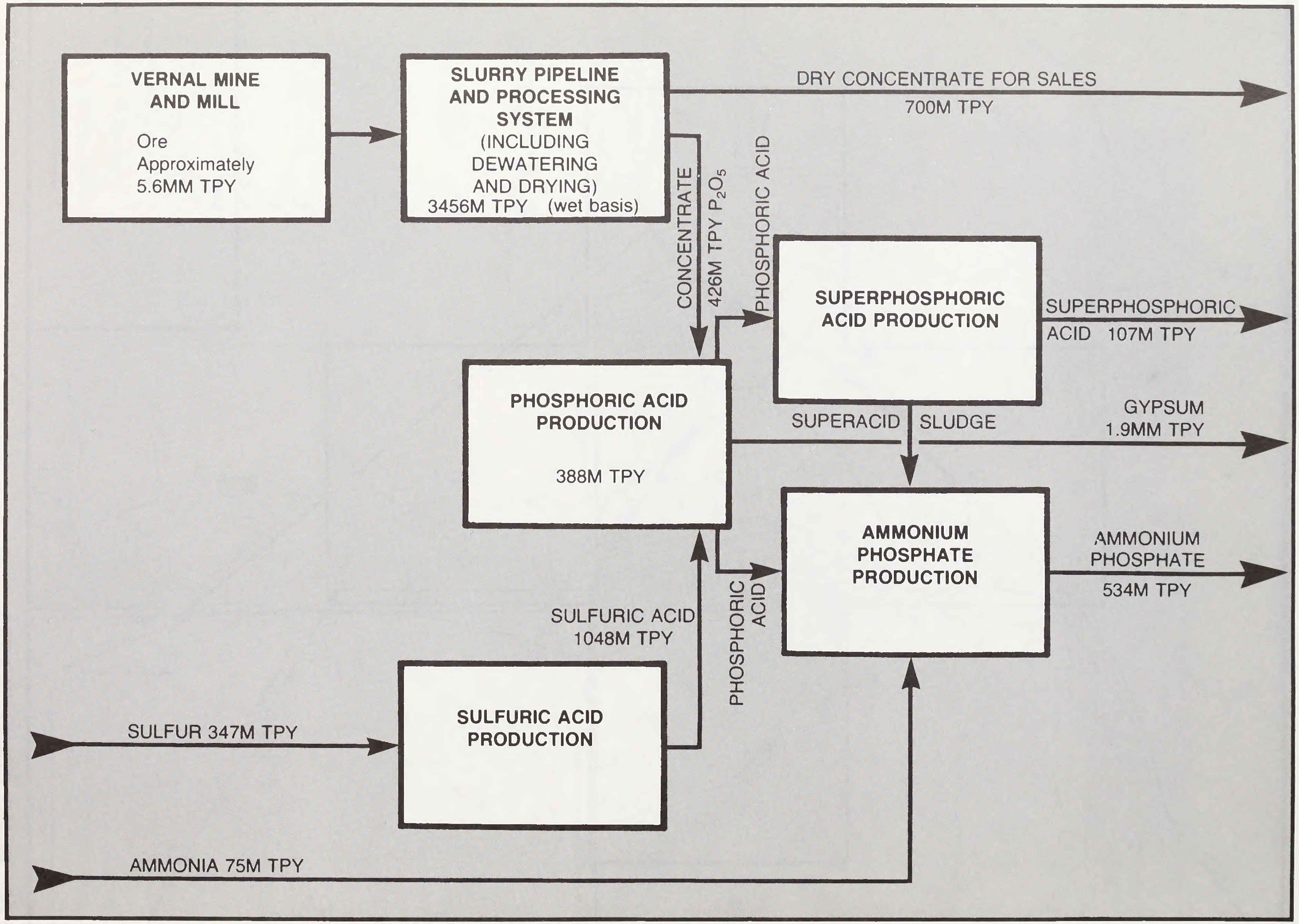


FIGURE 1-2 PROJECT BLOCK FLOW DIAGRAM

SOURCE: CHEVRON

An interpass absorption tower would absorb the sulphur trioxide into strong (98 to 99 percent) sulfuric acid. Product sulfuric acid, at the rate of 3,050 TPOD (1.048 million TPY), would be cooled and stored in tanks until transferred to the phosphoric acid plant. Emissions from the sulfuric acid plant would include sulfur oxides, acid mist, and nitrous oxides. The sulfuric acid plant would have a 23,000-gallon per minute (gpm) capacity cooling tower. Cooling tower blowdown would be returned to the process water system.

Phosphate Rock Concentration Receiving Unit: Upon delivery of the phosphate rock concentrates to the plant, the receiving unit would keep the concentrate in solution using rakes and air sparging in two 1.5-million gallon receiving tanks. Disc filter systems would dewater the slurry from 60 to 80 percent solids. Phosphate rock concentrate at 0.5 percent moisture content would result from the filter cake after drying. Water from the rock filter system would be stored in tanks for reuse in the plant. The concentrate driers and handling systems would be emission sources.

Dry phosphate rock would be shipped to markets by railroad at the rate of 700,000 TPY. Approximately 4,300 TPOD (dry basis) of phosphate rock concentrate slurry would be sent to the phosphoric acid plant.

Phosphoric Acid Plant: Sulfuric acid (3,300 TPOD) and phosphoric rock concentrate (4,300 TPOD) would be used to produce phosphoric acid at a rate of 1,200 TPOD expressed as phosphate P_2O_5. The reaction circuit would mix sulfuric acid and phosphoric rock to produce a solution of phosphoric acid, gypsum, and excess sulfuric acid. Chemical defoamers would be added to the solution and would be consumed in the product acid. The filtration circuit would separate the phosphoric acid from the waste solids primarily by using a vacuum filter. The resulting gypsum slurry would be pumped to the gypsum impoundment.

A clarifier would further separate any solids remaining in the acid after filtration. Clarified acid at 28 percent P_2O_5 would be pumped to the concentration circuit where steam-operated evaporators would concentrate the acid to 52 percent P_2O_5. Approximately 35 percent of the product acid (388,000 TPY) would be pumped to the superphosphoric acid plant from storage tanks, with the remainder going to the ammonium phosphate plant.

The phosphoric acid plant would include a 30,000-gpm capacity cooling tower. Blowdown from this tower would be returned to the filtration circuit. Fluoride emissions would be released from the phosphoric acid plant and its cooling tower.

Superphosphoric Acid Plant: The 52 percent P_2O_5 feed to the superphosphoric plant would be further concentrated by a steam-heated evaporator to 68 percent P_2O_5. From the evaporator, superphosphoric acid would go to a proprietary circuit for the removal of some magnesium oxide. Product superphosphoric acid at the rate of 107,000 TPY of P_2O_5 would be shipped by railroad to markets. The sludge containing 27,000 TPY of P_2O_5 and the recovered magnesium would be pumped to the ammonium phosphate plant. Fluoride emissions would be released from the superphosphoric acid plant.

Ammonium Phosphate Plant: Phosphoric acid at 52 percent P_2O_5 would feed the ammonium phosphate plant at the rate of 254,000 TPY P_2O_5. Phosphoric acid would react with 75,000 TPY ammonia and 27,000 TPY sludge to produce a slurry of ammonium phosphate. A rotary drum granulator would mix slurry with vaporized ammonia before drying. Screens would select product-size granular ammonium phosphate for storage and shipment by rail. Emissions including fluoride, particulates, sulfur oxides, carbon monoxide, volatile organic carbon, and nitrous oxides would be released from the ammonium phosphate plant.

Ponds: Two pond systems are proposed for this project. The gypsum impoundment pond would straddle sections 16 and 17, T. 18 N., R. 104 W. The ammonium phosphate unit cooling pond would be located in the SW 1/4 of section 15.

The two-celled gypsum impoundment pond would receive 1.9 million TPY of slurry waste from the phosphoric acid plant. The slurry containing 35 percent solids would have a pH of 2.5 and would contain many trace metals and some Radium-226. A containment dyke would be placed in the northwest corner of the gypsum field around the property line in section 8. The dyke would be designed to contain the gypsum within the plant boundary. Seepage control procedures for this pond are being designed. Chevron has stated that it will design the ponds to meet the policies and regulations established by the Wyoming State Engineer and the Department of Environmental Quality, Water Quality Division.

The gypsum impoundment pond would also receive storm runoff water from the fertilizer plant's storm drainage system. Fluoride and particulate emissions would be released from the impoundment.

The gypsum stack would have a maximum height of 130 feet and would cover about 400 acres after 20 years of deposition. Chevron proposes to contour, cap, and reclaim the gypsum stack.

The 10-acre ammonium phosphate unit cooling pond would cool 6,000 gpm of tail gas scrubber circulation water. To prevent excessive buildup of salts in the pond, 59 gpm of blowdown water would be discharged to the gypsum pond. Fluoride gas emissions would be released from the ammonium phosphate cooling pond.

Note: Pollution control equipment would be installed at the plant site. The emissions from the plant processes, as discussed in the previous paragraphs, will be controlled to meet Wyoming ambient air quality standards.

Davis Bottom Plant Process Water Pipeline

Chevron negotiated a contract with the State of Wyoming in February 1982, to purchase 22,500 acre-feet of water annually from the Fontenelle Reservoir (State of Wyoming 1982). The water would be released from Fontenelle into the Green River where it would be obtained for use in the vicinity of Davis Bottom within the Flaming Gorge NRA. (See Map 1-2 located inside the back cover pocket.) The entire 22,500 acre-foot volume is used to analyze the worst-case impacts.

Construction of the 18-inch diameter water supply pipeline from Davis Bottom at Flaming Gorge Reservoir (NW 1/4, section 16, T. 17 N., R. 106 W.) to the plant site, is scheduled to begin during the spring of 1984. The proposed pipeline, water intake structure at Davis Bottom, power transmission line, and road improvements would disturb approximately 140 acres.

To obtain initial plant production of 1,200 TPD of P_2O_5, the Davis Bottom water intake structure would have to provide 2,150 acre-feet of water per year. By 1995, the Davis Bottom intake structure would provide 11,310 acre-feet of water per year which would allow a production rate of 3,000 TPD of P_2O_5.

The water intake structure would withdraw approximately 3 cubic feet per second of water from the Green River (Figure 1-3). Intake water would filter through the rock fill into the settling pond and then be pumped to the fertilizer plant for treatment before use in the process. (The pump intakes would be screened.) A pump house and an electric substation surrounded by a 6-foot high, chain-link security fence would be needed at the intake structure location. A 34.5-kV power transmission line with wooden poles spaced at 250- to 300-foot intervals would provide the electricity. The power transmission line would extend south, 4.5 miles from the proposed plant substation, paralleling the existing 230-kV power transmission line. From this point, the transmission line would proceed west to the proposed pump station location.

Access to the pipeline right-of-way would be from an existing road and trail that traverses the MAPCO pipeline right-of-way. The road would require 0.7 mile of new construction to allow for passage of concrete and other large supply trucks to the construction site at Davis Bottom. Minor upgrading would be required along the 4.3-mile long existing road, followed by gravel surfacing of the entire 5 miles, where required, to ensure all-weather access. After construction, the pump station would be inspected two to three times a week. All disturbances associated with the pipeline, except the access road and the intake structure, would be reclaimed at the completion of construction.

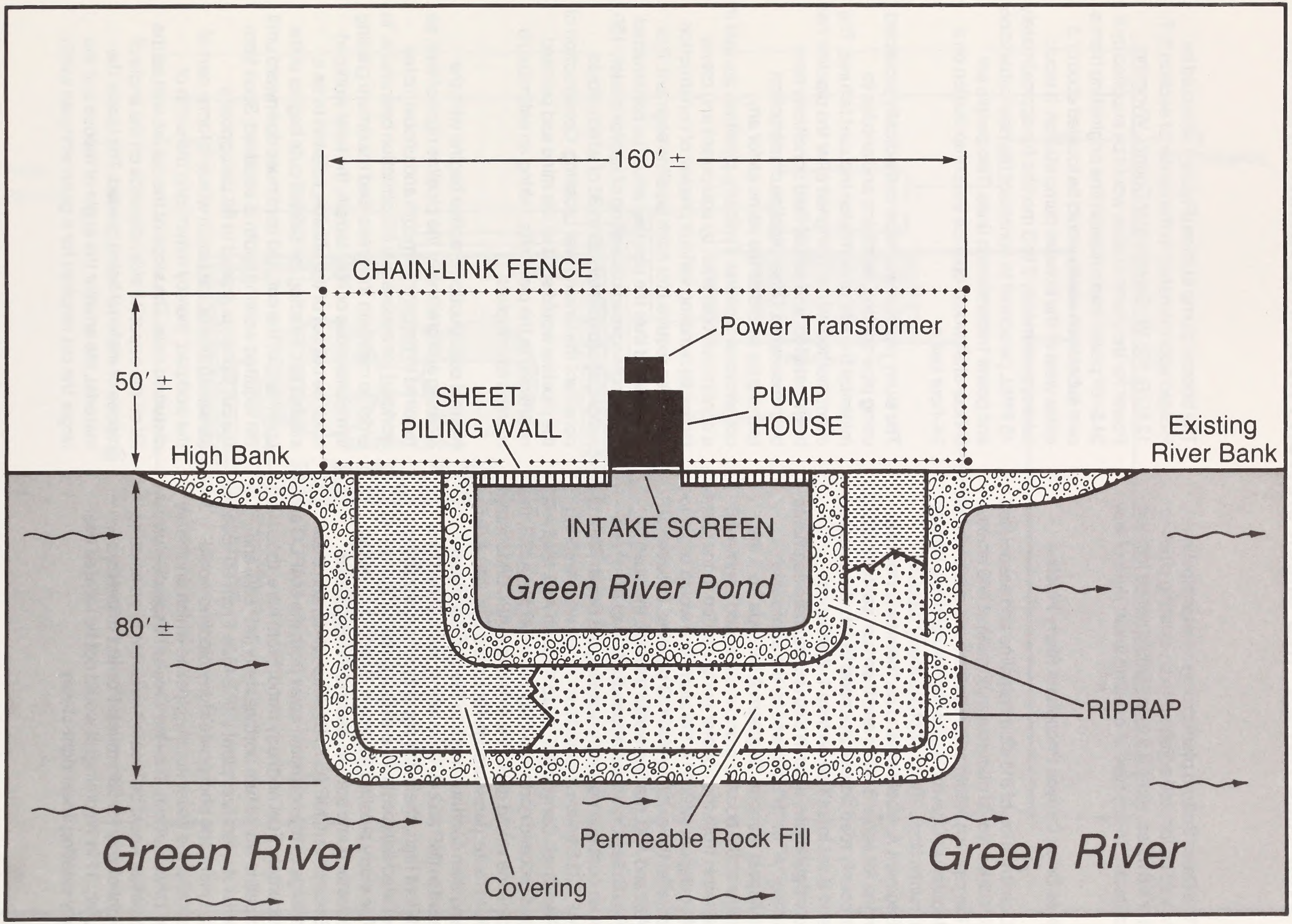


FIGURE 1-3 WATER INTAKE STRUCTURE PLOT PLAN

SOURCE: CHEVRON

The Davis Bottom plant process water pipeline would be located adjacent to an existing pipeline for 6.6 miles, while 9.8 miles would not be located adjacent to any type of existing linear right-of-way.

Red Creek Canyon Phosphate Slurry Pipeline

Construction of the slurry pipeline and associated facilities would disturb a maximum of 640 acres. The pipeline would originate from the pump station located at Chevron's existing Vernal mine, Uintah County, Utah. The phosphate slurry pipeline, Segment A, would extend northeasterly from the mine for about 8 miles and then turn easterly along a county road across Diamond Gulch. (Segments A and B are identified on Map 1-2; milepost configurations used in this text indicate segments using "A" or "B" followed by the approriate milepost number). Segment A extends from the mine to the booster pump station, and Segment B extends from the booster pump station to the plant. At milepost (MP) A17, the slurry line would begin to parallel the existing MAPCO pipeline. Between MP A28 and A30, the line would traverse the head of Rye Grass Draw (see Appendix 4, Map A4-1) and then continue northerly crossing the Green River at MP A33.5 where it would turn to the west entering Red Creek Canyon (MP A423 through A45, Map A42) and proceed north into Clay Basin. At MP A49.3, the pipeline would rejoin the existing MAPCO/Mountain Fuel route, pass through Richard's Gap (MP A49.5), and then continue north to the booster pump station (MP A52.4). The station, surrounded by a 6-foot high, chain-link security fence, would be located adjacent to the existing road (Figure 1-4). The slurry pipeline, Segment B, would leave the booster pump station, ascend the Red Creek Escarpment (MP B5 to B7, Map A4-3), and then diverge to the northeast away from the MAPCO and Mountain Fuel northerly trend. From here, the pipeline would turn northeasterly (MP B36) and enter the fertilizer plant (MP B45.8). From MP B35 to the plant, the phosphate slurry pipeline would parallel the water supply pipeline which originates at Davis Bottom. The Red Creek phosphate slurry pipeline would be located adjacent to an existing right-of-way for 58.1 miles. For 40.1 miles (29.1 in Utah, 11 in Wyoming), it would not be located near any existing linear right-of-way.

The booster pump station (Figure 1-4) would be located approximately in the center of section 3, T. 12 N., R. 105 W., Sweetwater County, Wyoming. Power for the pump station would be supplied by a 34.5-kV power transmission line originating from a new substation which would be located about 7.5 miles west of the booster pump station. It would take approximately 2 to 3 months for approximately 16 PP&L personnel to construct the new substation and power transmission lines. Two people per 8-hour shift would operate the pump station on a 24-hour basis.

The slurry pipeline would be cathodically protected using pipe coating, rectifiers, and anodes to minimize the risk of corrosion-induced failures. The exact method will be designed after the pipeline has been installed, and actual field conditions have been measured. Other pipeline construction techniques would be the same as for any conventional pipeline. Typically, pipelines are laid in a continuous operation by equipment and crews (spreads) handling various phases of construction activities required for each pipeline segment. It is anticipated that the pipeline would be constructed by a single spread consisting of approximately 150 people, approximately 25 to 30 of which would construct the Green River crossing. Construction of the pipeline would start at the mine and proceed northward to the plant site, taking an estimated 9 months to complete.

Normal construction practice begins with the clearing and grading of the pipeline right-of-way, as required to prepare a smooth and unobstructed workpad for successive construction operations. In order to maintain the prescribed maximum grading in mountainous or hilly terrain, the level workpad must be cut out of the hillside, referred to as a sidehill cut. Grading for sidehill cuts begins at the uphill end of the cut, and continues downward until the required working width is obtained. Spoil from the cut (uphill) is graded to fill the opposite (downhill) side of the bench where it forms part of the workpad, thereby minimizing the width of disturbed area. The slope of the cut (as well as the fill on the opposite side) depends on the angle of repose of material being graded. The looser the material, the smaller the angle of repose and the larger the cut required for a given workpad width.

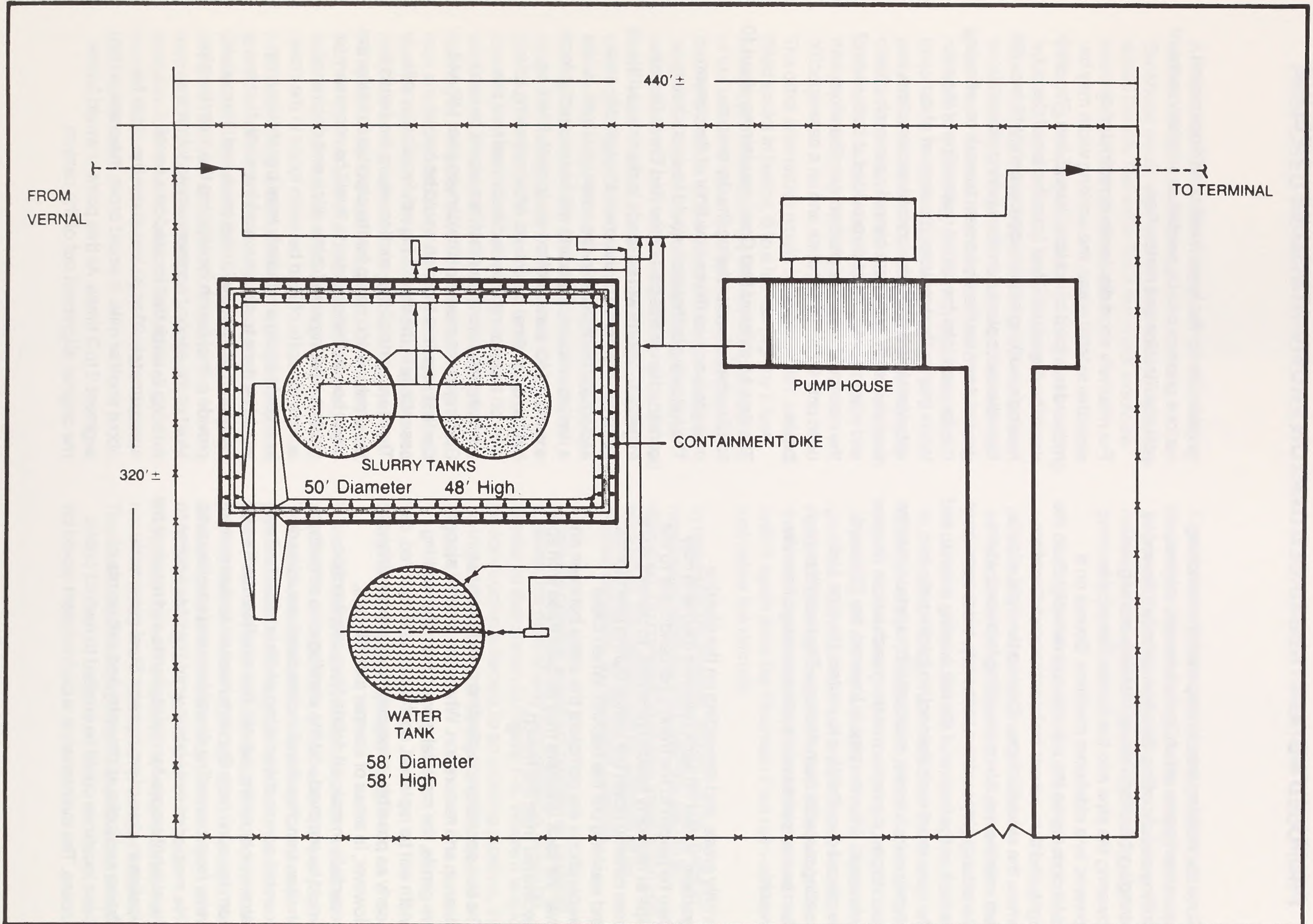


FIGURE 1-4 BOOSTER PUMP STATION PLOT PLAN

SOURCE: CHEVRON

Once the working area is prepared, the trenching operation begins which, in rock terrain, may require drilling and shooting. This operation is followed by stringing, bending, line-up, welding, coating, and lowering the pipe into the trench. The pipe is lowered by a sideboom machine. Booms on a sideboom are on the left and counterweights on the right, and they cannot be interchanged; therefore, where the sidehill slopes down to the right, pipe is laid with the machines travelling foreward; where the sidehill slopes down to the left, sidebooms have to back to the far end of the left sloping sidehill, and the crew must work the section backwards. In stoney or rock areas, selected fill material would be used to pad the bottom of the trench before the pipe is lowered. After the pipe is lowered, the fill would be placed over the pipe to protect the pipe and coating material from damage. The backfill may then be completed with spoil excavated from the trench.

In hilly areas, and depending on the pipeline gradient, select fill sack breakers (barriers) may then be placed in the trench, perpendicular to the pipe at regularly spaced intervals, to prevent water from running down the trench during rain storms and washing out the backfill. When these preparations are complete the areas between and over the sack breakers may be backfilled with spoil excavated from the trench.

The last operation on pipeline construction is cleanup and restoration. Where the sidehill slopes are gentle, the material graded from the working width will be replaced, contoured, and restored, as nearly as possible, to preconstruction conditions. However, in areas of steeper sidehill cuts, especially in rock, all debris from construction would be removed and the working area smoothed. Shallow trenches (6 to 9 inches deep) would be dug downhill across the working width in order to divert rainwater or spring run-off. The small berms formed from the spoil from the trench would further prevent water from cascading downslope and creating ruts. This method of restoration would provide access to the sidehill slopes for maintenance and repair of the pipeline in case of emergency. Steel gates with chains and locks at the entry and exit points of these locations could be erected to restrict public access. The maintenance superintendent would be responsible for the keys. If soil conditions permit, various grasses can be seeded as another means of soil stabilization and restoration.

For relatively short distances in restricted or sensitive sidehill areas, the working width may be reduced to a total of not less than 25 feet. The ditch would be dug about 7 feet from the toe of the cut, leaving a working side of approximately 18 feet. Fill from the cut is placed on the working side and graded down for the equipment to work on, allowing it to be used later for partial restoration of the cut. While this method reduces the amount of cut substantially, it hampers normal construction, in that pieces of equipment cannot pass each other and staging areas must be provided at both ends of the restricted area. The method can, therefore, be used only for short sections and on a case-specific basis.

The first 1.5 miles of Red Creek, containing about 10 to 12 inches of water during the dry season, meanders across the narrow floor of the canyon. The following techniques would be used during construction in this part of the Red Creek Canyon. In general, efforts will be made to disturb as little as possible, the banks of the creek through this area, and to lay the pipeline in the creek bed itself. While a limited amount of grading will be required to form a workpad for construction equipment, it will be held to a practical minimum. After reviewing this area on the ground, is was determined that the following construction practices would be used. Starting at the mouth of the canyon near MP A42, the first segment the pipe would be buried essentially in the creek channel for about a mile. There are parts of this section where the bends in the creek are too sharp for the pipeline to follow the creek bed. In these sections, it will be necessary to grade a working area for the ditch and ditch spoil across the spits of land between loops in the creek, in order to to dig a relatively level trench. Grading would be done to obtain a working width that has a fairly uniform grade with the creek bed. This would provide a level bench for aligning the mainline pipe. Most of the second segment would follow the existing 2-track trail located on a bench approximately 20 to 30 feet above the creek for about another mile. It would cross the creek in this segment 2 to 3 times. At this point, it would follow the original alignment out of the canyon.

A rock crew would follow the grading crew, drilling and shooting the rock along the trench line. Backhoes would dig the fractured rock to make the actual trench. The water from the creek would be running down the pipeline trench.

Stringing, bending (side bends), line-up, and welding would not be affected by any of these operations. Since running water in the ditch would wash away backfill and padding materials, a concrete-coated pipe would be used. A concrete-coated pipe would not need any padding, would not require dry ditch installation because flotation would not be a problem, and could be backfilled immediately with the shot rock excavated from the trench. The action of the water would wash fines in the rock fill, thereby, stabilizing the backfill.

The other alternative would be to place dirt- or sand-filled sacks in berms, 6 to 8 inches high by 2 feet wide, approximately every 20 feet along the bottom of the trench in order to keep the lowered pipe off the rocky bottom of the trench. The pipe would be weighted, as necessary, or filled with water, and would then rest on these berms. Earth- or sand-filled bags would then be placed on each side of each creek crossing to form a berm to the top of the trench. The water would then be rechanneled into its original streambed. Since the water would no longer be flowing down the ditch line, fine gravel or dirt could be placed in the trench until the pipe was covered, and then final backfilling could be completed. If select backfill were not available, the coating of the pipe could be protected by using a rock shield banded around the pipe. The pipe would then be backfilled with gravel, which is readily available on the canyon floor; backfilling would be completed with the rock excavated from the trench. Further studies and site investigations should be made to determine the most appropriate method.

After backfilling is completed, all the spoil that was graded to form the slot would be replaced and levelled, and the creek banks restored as nearly as possible to preconstruction conditions. The restored creek banks would be rip-rapped with available rock or with sacks filled with a sand-cement mixture to protect the pipeline and creek bed from erosion.

Conventional pipeline construction methods could be used for the remaining 2 miles along the canyon. Any creek crossings in this section would be restored in a manner similar to that which was previously described.

At the Red Creek Escarpment, the proposed route runs parallel and adjacent to the Mountain Fuel pipeline (on its west side) and follows it as it ascends the escarpment to a point where the proposed route approaches the limiting gradient of 15 percent, about 0.35 mile from the top of the bluff. At this point, it begins a switchback by turning approximately 135 degrees to the left, assuming an almost due southerly direction for about 0.25 mile, ascending the bluff in a sidehill cut at a 15 percent gradient. At this point it turns 135 degrees to the right, completing the switchback. It then ascends the remaining contours of the bluff in a sidehill cut until it again joins the Mountain Fuel right-of-way just below the rimrock.

In traversing the rimrock, efforts will be made to remove and store the rock over the area to be disturbed. On completion of pipe installation and backfilling, the rimrock will be restored to its original condition, to the extent possible.

Where the pipeline would not parallel an existing pipeline, the right-of-way configuration would be similar to that shown in Figure 1-5. Where it would be constructed adjacent to an existing pipeline, the configuration would be similar to that shown in Figure 1-6.

Slurry Water Supply (Tailings Pond)

Water for the phosphate slurry pipeline would be required at an initial rate of 930 acre-feet per year. The water requirement for the phosphate slurry pipeline would eventually be 1,290 acre-feet per year. This increase in water demand would be due to the increase in flow of phosphate in the pipeline. Chevron proposes that the slurry water would come from the existing tailings pond at the Vernal phosphate mine. The use of this water source would not be different from that which presently exists. Therefore, since no additional impacts would occur,

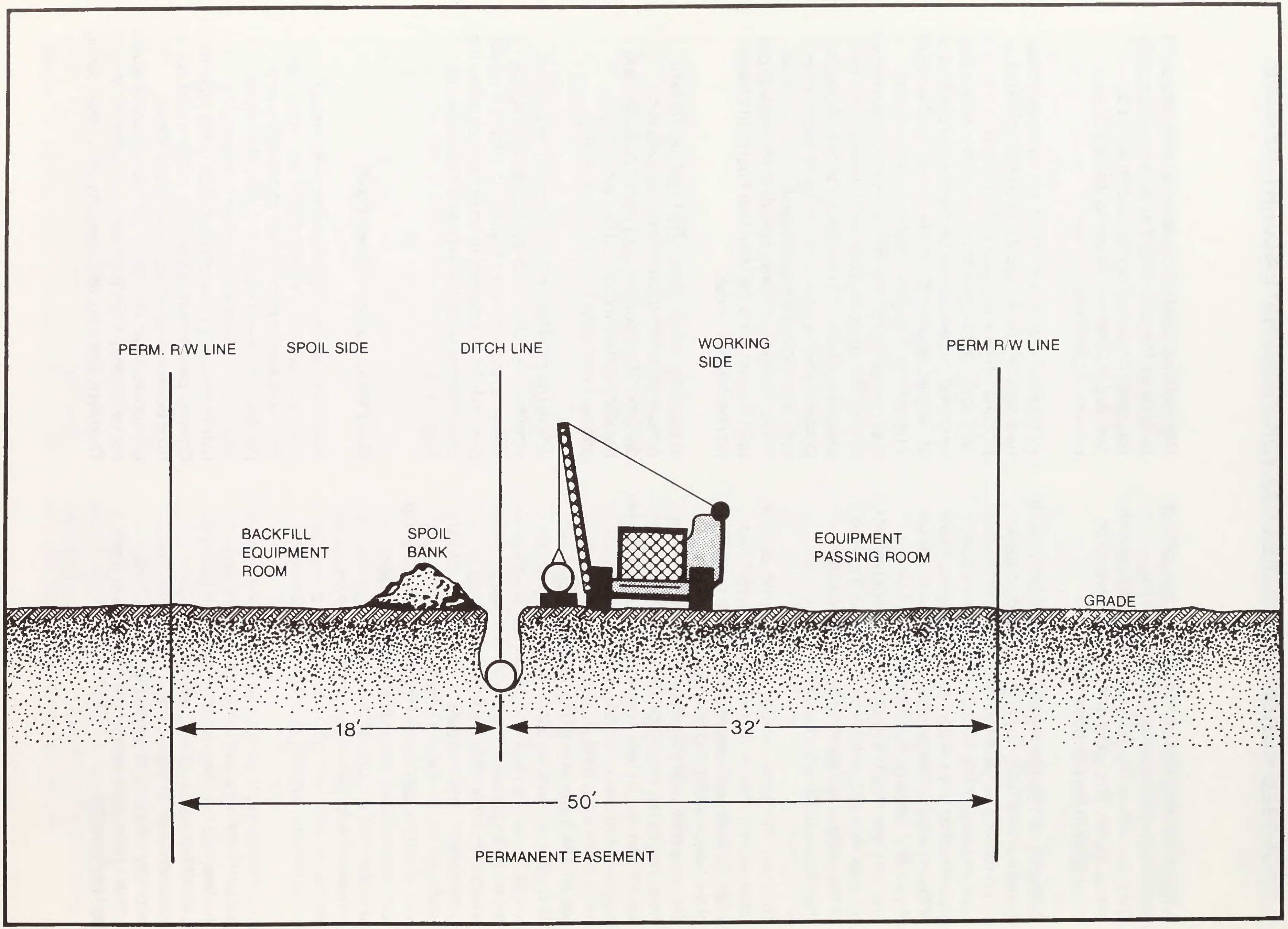


FIGURE 1-5 SINGLE PIPELINE RIGHT-OF-WAY CONFIGURATION

SOURCE: CHEVRON

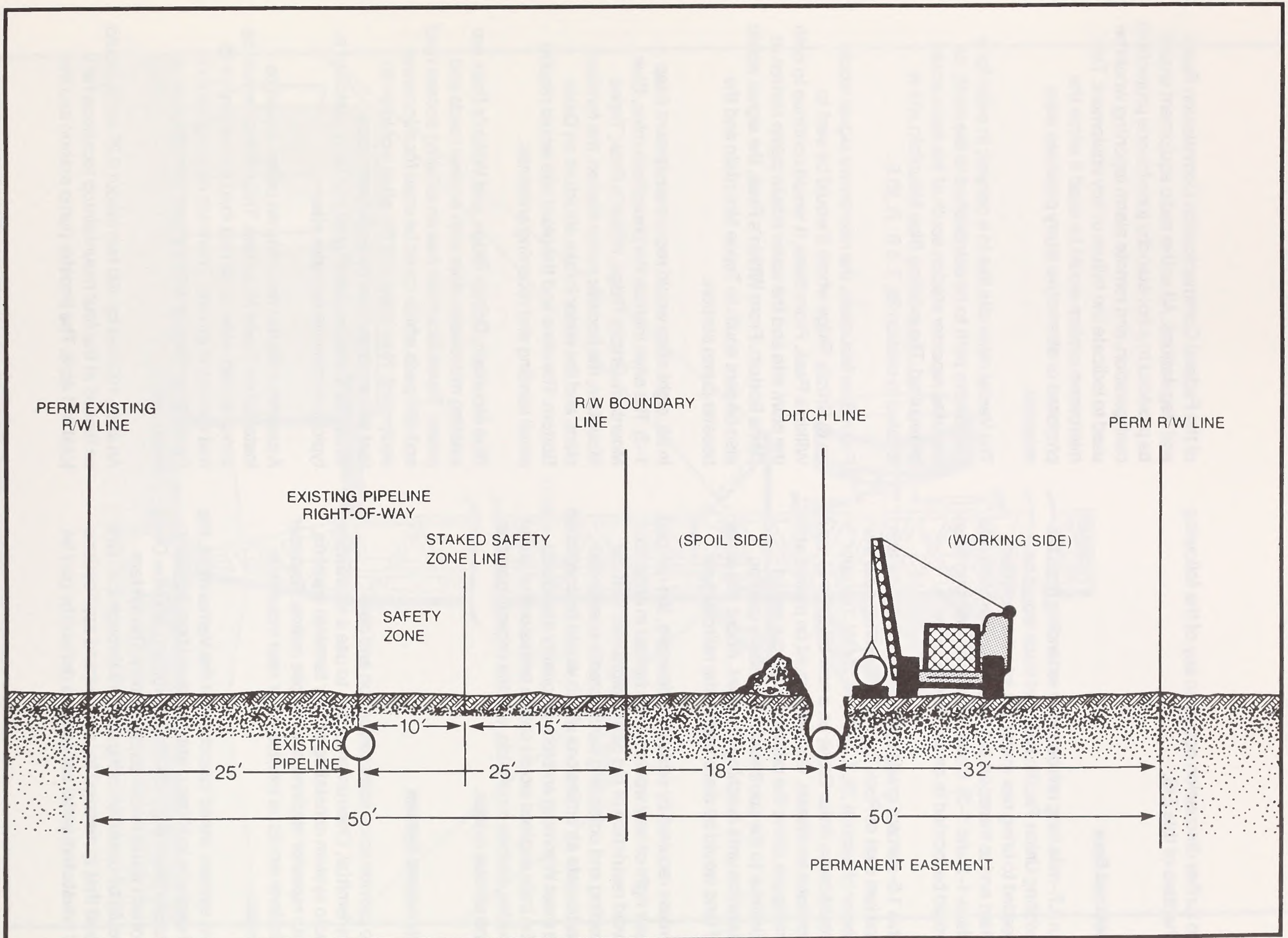


FIGURE 1-6 SINGLE PIPELINE ADJACENT TO ANOTHER PIPELINE RIGHT-OF-WAY CONFIGURATION

SOURCE: CHEVRON

no further discussion occurs in any of the following chapters of this EIS.

Railroad Spur

An 8.7-mile long railroad spur extending from the existing Union Pacific Railroad track would be needed to bring raw materials into the fertilizer plant and to transport products from the plant (see Maps 1-2 and 1-3). None of the 8.7-mile long spur would be located in an existing corridor.

This 1.5-percent grade spur would leave the main line just east of Rock Springs, Wyoming, near the center of section 29, T. 19 N., R. 104 W. The spur would cross Bitter Creek on a new bridge and would continue southeast. Culverts would be placed at all drainages along the railroad. The spur would continue to the southeast, continually gaining elevation until reaching the plant. About 159 acres of land would be disturbed by the railroad spur.

Unless required by private landowners, the railroad spur right-of-way would not be fenced in order to avoid restriction of big game migration. Rail car loading and unloading would create suspended particulate air emissions which would be controlled to meet Wyoming ambient air quality standards. The train engines would create emissions of sulfur oxides, carbon monoxide, volatile organic carbons, and nitrous oxides.

Microwave System

To provide voice communication and data transmittal, Chevron proposes to use a microwave radio system consisting of four terminal stations, four repeater stations, and mobile radios. Repeater stations would be located on or near mountain peaks.

The system would interconnect the Vernal mine, the phosphate fertilizer plant, the slurry booster pump station near Richard's Gap, Wyoming, and the Davis Bottom water intake pump station. The system would be operated using the 2.13 through 2.20 GHz band that is reserved for narrowband applications of private/industrial services as defined by part 94 of the Federal Communication Commission Rules and Regulations. All active radio equipment would be provided in a hot-standby (one-for-one protection) configuration, and remote alarm reporting would be used to indicate the failure of any equipment. This microwave system would be used if either the proposed or alternative slurry pipelines were selected.

The Vernal mine site lies in a canyon; in order for a microwave path to be established to the north, an elevated repeater station south of the mine would be required. The existing Blue Mountain site is located in section 30, T. 5 S., R. 25 E.

From Blue Mountain, the microwave signal would go to Grizzly Ridge where it would be sent to Wilkin's Peak. From there, it would continue to both the plant site and the water intake pump station at Davis Bottom. From Wilkin's Peak, the signal would also be sent south to Tepee Mountain and the booster pump station.

In all, eight sites would require equipment (Map 1-2). The sites include the phosphate mine, Blue Mountain, Grizzly Ridge, Wilkin's Peak, Tepee Mountain, the booster pump station, the fertilizer plant, and the water intake structure on Davis Bottom. The mine and the plant site would require small sending and receiving antennas.

Blue Mountain, Grizzly Ridge, and Wilkin's Peak are existing microwave sites with access roads and power. Tepee Mountain has an existing access road and drill pads which could be used for microwave equipment. New towers at the sites would be 30 feet tall accompanied by an 8-foot cubed equipment shelter. See Figure 1-7 for a sketch of a typical microwave repeater site.

A passive reflector requiring no power would be installed on Tepee Mountain. The reflector would be about 30 feet wide by 32 feet long and mounted 15 feet above the ground. There are existing roads in the area and construction of any new roads is not anticipated.

An area, 100 feet by 100 feet (about 0.25 acre), would be fenced at the four mountaintop locations for a total of 1 acre. The booster pump station and the

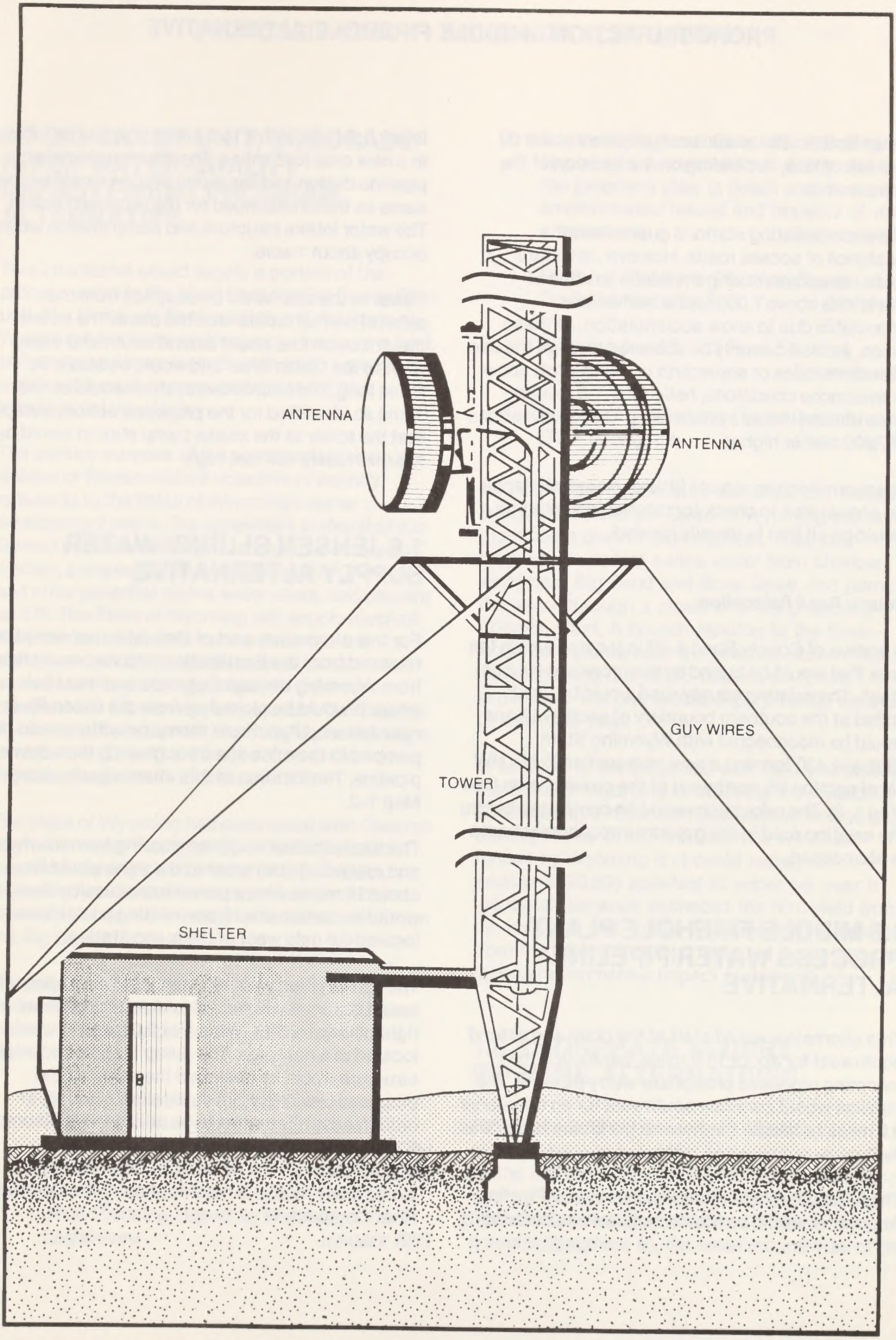


FIGURE 1-7 TYPICAL MICROWAVE REPEATER SITE

SOURCE: CHEVRON

Davis Bottom site would each require a tower 50 feet tall or less, depending on the location of the components.

The use of existing stations guarantees the existence of access roads. However, standard vehicular access during the winter to sites at elevations above 7,000 feet is sometimes impossible due to snow accumulation. At these times, access can only be achieved through the use of snowmobiles or snowcarts or, during soft snow or avalanche conditions, helicopter. All existing sites utilized in this system design are at elevations of 7,200 feet or higher.

Passive reflectors require little or no maintenance. An annual visit to check for mechanical integrity would be all that is usually needed.

County Road Relocation

A portion of County Road 4-27 is located within the area that would be buried by the proposed gypsum stack. The existing county road would be dead-ended at the southern boundary of section 17 and would be reconnected with Wyoming State Highway 430 forming a new intersection in the NW 1/4 of section 15, northwest of the process area (see Map 1-3). The relocation would be completed before the existing road in the gypsum impoundment area is abandoned.

1.5 MIDDLE FIREHOLE PLANT PROCESS WATER PIPELINE ALTERNATIVE

This alternative would start at the plant and extend southwest for about 10.9 miles, paralleling the incoming proposed phosphate slurry pipeline. The pipeline would continue southwest for an additional 9.5 miles to Middle Firehole on the Green River (Map 1-2).

The Middle Firehole Plant Process Water Pipeline Alternative would be located adjacent to an existing linear right-of-way for 15.4 miles. It would be located in a new area for 5 miles. The 18-inch diameter pipeline design and the pump station would be the same as those described for the proposed action. The water intake structure and pump station would occupy about 1 acre.

Power to the site would be supplied from the substation that would feed the plant. The power transmission line would extend south and then west to the Green River and would be about 14 miles long. The microwave system would be the same as identified for the proposed action, except that the tower at the intake pump station would be approximately 150 feet high.

1.6 JENSEN SLURRY WATER SUPPLY ALTERNATIVE

For this alternative, part of the water that would be released from the Fontenelle Reservoir would flow from Wyoming through Colorado and into Utah where it would be picked up from the Green River near Jensen, Utah. From there, the water would be pumped to the mine site through a 12-inch diameter pipeline. The location of this alternative is shown on Map 1-2.

The total pipeline length originating from the river and extending northwest to the mine would be about 19 miles. A new power transmission line would be constructed from existing power lines located 0.6 mile west of the pump station.

The Jensen Slurry Water Supply Pipeline Alternative would be located adjacent to an existing linear right-of-way for 18.4 miles. For 0.6 miles, it would be located in a new area. The pump station and intake structure would be designed the same as the proposed Davis Bottom station in Wyoming. In order for the alternative to be utilized, the Colorado State Engineer would have to approve the appropriation of the water from Colorado. This would likely require a modification of the Colorado River Compact.

1.7 BIG SANDY UNIT, COLORADO RIVER WATER QUALITY IMPROVEMENT PROGRAM ALTERNATIVE

This alternative would supply a portion of the process water to the plant from the Big Sandy River unit. The Bureau of Reclamation and the State of Wyoming have been working very closely on a joint unit study and have recently signed an agreement which outlines their responsibilities for the remainder of the study.

The primary purpose of the agreement is to tie the Bureau of Reclamation's objective of salinity reduction to the State of Wyoming's water development plans. The agreement states that the Bureau of Reclamation will study a collector well system, pumping plant, and pipeline for Chevron and other potential saline water users, and prepare an EIS. The State of Wyoming will supply much of the environmental data to be included in the advanced draft EIS, and will provide funds to accelerate the planning process in order to complete the EIS as early as possible. The State of Wyoming will also assist in writing and reviewing a joint planning report to be submitted to the Wyoming Legislature in January 1983.

The State of Wyoming has contracted with Chevron to provide water for the proposed fertilizer plant near Rock Springs; and as part of the contract, Wyoming has the option to supply some of the Chevron plant's water needs with saline water from the Big Sandy River unit.

The proposed Big Sandy Salinity Control Project River Unit reports which would be prepared under the new process and the schedule are presented below:

Plan Formulation Working Document (discusses plan formulation process and presents alternatives including the proposed plan)	October 1982
Joint Planning Report to Wyoming Legislature	January 1983
Proposed Regional Director's Planning Report and Advanced Draft EIS (presents the proposed plan in detail and discusses environmental issues and impacts of viable alternatives)	September 1983
Regional Director's Planning Report and Draft EIS filed with EPA	March 1984
Planning Report and Final EIS filed with EPA	December 1984
Secretary of Interior's Report (with final EIS) to Congress	December 1985

As part of the accelerated schedule, the Bureau of Reclamation and the State of Wyoming met and proposed a plan of development. Their plan proposes to collect saline water from shallow wells near Big Bend and Bone Draw, and pump the water through a pipeline to the proposed Chevron plant. A branch pipeline to the trona (soda ash) plants near the town of Green River is also proposed but would depend on future expansion. The unit would supply 14,400 acre-feet of water per year.

In addition to the proposed well field and pipeline, the State of Wyoming is studying the feasibility of constructing a reservoir near Gasson Bridge along the Big Sandy River. The reservoir would be funded by Wyoming and could supply an additional 20,800 acre-feet of water per year if industrial demands exceeded the firm yield from the collector well fields. A discussion of impacts from the reservoir will be included in the planning report/environmental impact statement.

1.8 PHOSPHATE SLURRY PIPELINE ALTERNATIVES

For all of the phosphate slurry pipeline alternatives, the following items would essentially be the same as described for the proposed action: booster pump station, location of the pipeline from the booster pump station to the plant complex (Segment B), the location and size of the power transmission line, and microwave communication facilities (Map 1-2).

1.8.1 MAPCO

The MAPCO alternative (Segments A and B) would be 96.3 miles long and would disturb 624 acres (includes associated facilities). The alternative route would be in the same location as the proposed action for the first 37 miles. The line would head northeast from the mine for about 8 miles to a point just east of the northeast corner of the property. At this point, it would turn east across Diamond Mountain to intersect the route of the existing MAPCO pipeline at about MP A17. The slurry pipeline would then parallel the existing MAPCO right-of-way through Mail Draw and down through Rye Grass Draw (Map A4-1) to the Green River at about MP A33.5.

The pipeline would then continue northward, cross the Green River, and climb through Jesse Ewing Canyon (Map A-44). It would leave the proposed action route before entering Jesse Ewing Canyon at MP A37. From here, it would turn to the northwest and cross Clay Basin to Richard's Gap at about MP A47.5. The pipeline would then continue north, paralleling the MAPCO/Mountain Fuel pipeline to the booster pump station at MP A50.5.

The MAPCO phosphate slurry pipeline alternative would be adjacent to an existing linear right-of-way for 66.1 miles. It would be in a new area for 30.2 miles (19.2 in Utah, 11 in Wyoming).

Any construction through Jesse Ewing Canyon would require periodically closing the road to public access during construction. Disruption would continue for approximately 2 months.

1.8.2 Northwest

This alternative (Segments A and B) would be 88.1 miles long and would disturb 580 acres (including associated facilities). The alternative route would be in the same location as the proposed action for the first 9 miles. At this point, it would continue northeast to about MP A14, where it would intersect the Northwest pipeline right-of-way. The Northwest phosphate slurry pipeline route would join and parallel the existing Northwest pipeline right-of-way northwest through Davenport Draw and cross the Green River near Little Hole Campground (MP A27).

The pipeline route would then turn westward, still paralleling the Northwest pipeline. At MP A29, it would branch away and head northwest to Dutch John Canyon. It would then proceed north and northeasterly around the base of Goslin Mountain (Map A4-5) by way of Dutch John Canyon and Antelope Flat, and continue northeasterly intersecting the proposed action route at a point north of Richard's Gap. From Richard's Gap to the booster pump station (MP A42.3), the alternative pipeline route would be the same as the proposed action.

The Northwest Phosphate Slurry Pipeline Alternative would be adjacent to an existing linear right-of-way for 51.3 miles. It would be in a new area for 36.8 miles (24.7 in Utah, 12.1 in Wyoming).

For the Goslin Mountain section (MP A29 to A32), construction practices for the sidehill cuts would be similar to those described for the proposed action.

1.8.3 Willow Creek

This alternative would be 96.8 miles long and would disturb 627 acres (including associated facilities). The Willow Creek alternative would leave the MAPCO route at approximately MP A35 and rise approximately 1,000 feet in elevation over the next 3 miles. At approximately MP A38, it would start sidehill sloping upwards along Cottonwood Draw and paralleling Jesse Ewing Canyon (Map A4-6). The pipeline would rise approximately 800 feet within the first 2.25 miles, and generally follow the 6,400- to 6,600-foot elevation contour until it tied into the MAPCO route at the top of Jesse Ewing Canyon.

At this point, for approximately 1 mile, the route would encounter many of the same problems discussed for Jesse Ewing Canyon. In particular, the preparation of a work pad in the rocky hillside will unavoidably cause spoil and rock to be deposited on the roadway in the canyon. It would, therefore, be necessary to periodically close the road to public access for period of time during construction.

Sidehill slopes are estimated to be as high as 65 percent for portions of the last 2.5 miles. Therefore, cuts of 40 feet or more would be required in order to obtain a normal right-of-way width, keeping the pipeline in undisturbed soil and using the soils as fill for the working area. Construction practices would be the same as described for the proposed action.

The Willow Creek Phosphate Slurry Pipeline Alternative would be adjacent to an existing linear right-of-way for 62.6 miles. It would be in a new area for 34.2 miles (23.2 in Utah, 11 in Wyoming)

1.9 NO-ACTION ALTERNATIVE

The No-Action Alternative would involve the denial of the requested rights-of-way for the plant process water pipeline, phosphate slurry pipeline, power transmission lines, access roads, and railroad spur.

Under the No-Action Alternative, no change from current management direction or level of management intensity would occur, and the current level of development and patterns of management would be maintained, especially as related to BLM-administered land in the affected area. No major permanent facilities for this project would be built on BLM-managed land. This would result in a continuation of existing trends in the area including major planned projects other than Chevron's proposed project.

Without the rights-of-way, Chevron would not be able to develop the proposed fertilizer complex since it has been determined that trucking phosphate rock, sulfur, and water is infeasible (see section 1.10).

1.10 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

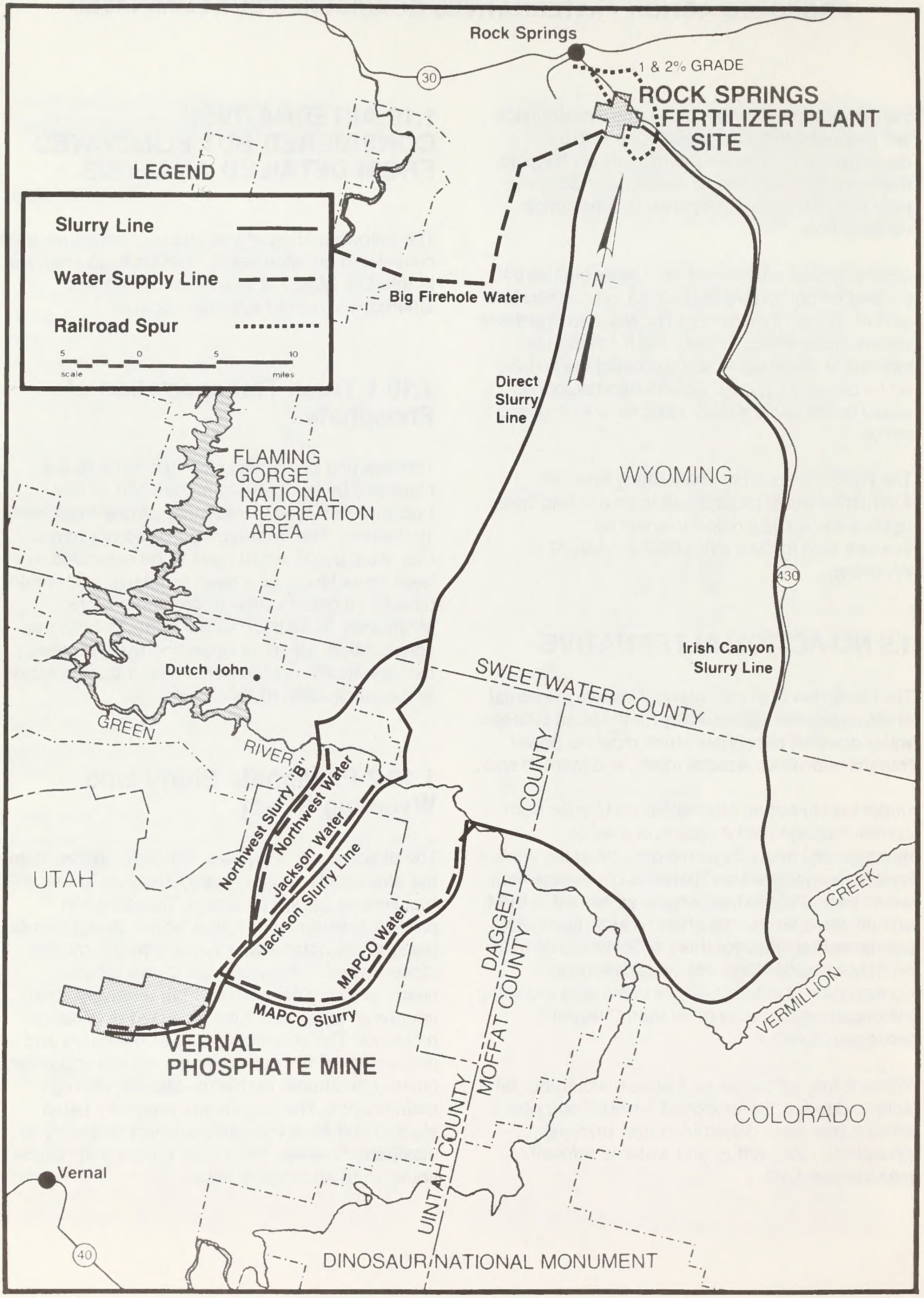
The following alternatives and railroad spurs were considered but eliminated from detailed analysis in this EIS. Map 1-4 indicates where these alternatives would have been located.

1.10.1 Truck Transportation of Phosphate

Transporting phosphate from the mine to the plant site by truck would require 150 40-ton trucks each day at a frequency of one truck every 10 minutes. The existing road could not handle this volume and would have to be expanded to at least three lanes, or a new multi-lane road would have to be built in Utah to cross the Uinta Mountains. In addition to the impacts from this construction, safety of operating trucks through the mountains in winter was also a consideration in the elimination of this alternative.

1.10.2 Phosphate Slurry Line Wyoming Direct

The direct slurry line route, although shorter than the alignments given detailed analysis in this EIS, had several design problems. These design problems were inherent to a nearly straight route being constructed over rugged topography and steep slopes. Energy caused from excessive heads of slurry occurring within relatively short lengths of pipe, would have caused dissipation problems. The abrasive nature of the slurry and dissipation of the energy would abrade equipment, create operational problems, and require high maintenance. The alignments presently being studied still have the same amount of energy to dissipate; however, the longer pipe would reduce abrasion to acceptable levels.



MAP 1-4 ALTERNATIVES CONSIDERED BUT ELIMINATED

1.10.3 Northwest Slurry Line Alternative B

This portion of the Northwest pipeline alignment was dropped from detailed study due to design constraints. This alternative showed no environmental advantage over the Northwest Phosphate Slurry Pipeline Alternative.

1.10.4 Big Firehole Water Supply Pipeline Alternative

The Big Firehole Water Supply Pipeline Alternative was dropped from detailed study because, although impacts would have been similar to other alignments, its added length would result in more disturbance.

1.10.5 Railroad Spur (1 and 2 percent grade)

All of the railroad spurs would have traversed similar terrain and crossed about equal portions of private and public lands (BLM). The different routes were compared to determine the lowest grade of incline with the least amount of length. As design proceeded, it was found that the Union Pacific Railroad would have to install retard equipment and employ extra engines in order to ensure safe, reliable operations at a 2 percent grade. Similarly, the 1 percent grade railroad spur was too long, would use more land, cause more disturbance, and would have no environmental benefits over the proposed 1.5 percent grade railroad spur.

1.10.6 Water Pipelines Paralleling the Proposed and Alternative Slurry Lines to the Green River

These water pipelines were not studied in detail for a variety of reasons. A primary contributing factor was the fact that it would make little difference in the flow of the river where the slurry water is withdrawn. In addition, a parallel pipeline would cause more disturbance in the right-of-way, be longer than other water pipelines and, therefore, cost more, and require a pumping station at a site requiring construction of a new electrical power transmission line. This would result in increased land disturbance and visual impact to unacceptable visual resource management levels.

1.10.7 Irish Canyon Alternative

The Irish Canyon Alternative was given considerable study before being dropped from detailed analysis. This alternative was found to have a number of environmental, engineering, and economical constraints.

The route through Irish Canyon would have added about 40 additional miles to the proposed 98-mile long pipeline. A pump station would be needed inside or very near the canyon. The 34.5-kV power requirements for this pump station would have to come from the Diamond Mountain area through Brown's Park, involving new construction and a significant amount of additional environmental impact. Power consumption during operation would have also been higher and the overall energy efficiency lower. Irish Canyon contains several known archaeological sites. Although no intensive inventory has been made in this area, it is very likely that numerous potentially sensitive cultural resource values are present. There is also a strong possibility of finding evidence of Paleo-Indian occupation.

The Irish Canyon alternative was dropped not only because of its excessive length, but because it did not appear to offer any clear environmental advantage over the other alternatives.

1.10.8 Jackson Draw Alternative

This pipeline route was dropped from detailed study because of design constraints. The slope of the pipeline in its descent to the Green River Valley would exceed allowable maximums if the pipeline were not switchbacked. With switchbacking, excessive amounts of benching in nearly solid rock would be required. In addition, the visual resources for the area would be significantly, adversely affected. The pipeline right-of-way would be located within a VRM Class II area (BLM 1979a) and be visible for an average of 2 hours by float boaters using the Green River. The unacceptable visual impacts would be caused by long-term contrasts in the modified landform and the straight line vegetation clearing and ensuing revegetation as viewed from the river. This portion of the Green River was found eligible by the National Park Service for inclusion into the Wild and Scenic Rivers System and has been recommended for scenic classification within that system (NPS 1979).

1.10.9 Red Creek Badlands WSA Alternative

Based on topography, even though a feasible slurry pipeline route up Red Creek Badlands exists, the route would pass through the center of the Red Creek Wilderness Study Area. For that reason the Red Creek Badlands alternative was not analyzed.

1.11 SUMMARY

The data summaries for the proposed action and alternatives are shown in Tables 1-5 through 1-12.

TABLE 1-5

PROPOSED ACTION: ACRES DISTURBED, REMOVED, AND RECLAIMED

Component	Length (Miles)	Construction Width (Feet)	Acres Disturbed[a]	Acres Removed[b]	Acres Reclaimed[c]
Plant Complex					
Plant Facilities	NA	NA	530	530	0
Power Substation	NA	NA	1	1	0
Power Transmission Line	7.0	20	17	0	17
County Road Relocation	1.6	150	29	29	0
Railroad Spur	8.7	150	159	159	0
Component Total:	NA	NA	736	719	17
Davis Bottom Plant Process Water Pipeline					
Pipeline	16.4	50	100	0	100
Pump Station	NA	NA	1	1	0
Access Road	5.0[d]	25[e]	15	15	0
Power Transmission Line	10.0	20	24	0	24
Component Total:	NA	NA	140	16	124
Red Creek Phosphate Slurry Pipeline					
Pipeline	98.2	50-60	617	0	617
(Segment A)	(52.4)	(50-60)	(332)	(0)	(332)
(Segment B)	(45.8)	(50-60)	(285)	(0)	(285)

TABLE 1-5 (concluded)
PROPOSED ACTION: ACRES DISTURBED, REMOVED, AND RECLAIMED

Component	Length (Miles)	Construction Width (Feet)	Acres Disturbed[a]	Acres Removed[b]	Acres Reclaimed[c]
Booster Pump Station	NA	NA	3	3	0
Power Substation	NA	NA	1	1	0
Power Transmission Line	7.5	20	18	0	18
Microwave System	NA	NA	1	1	0
Component Total	NA	NA	640	5	635
Proposed Action Total	---	---	1,516	740	776

[a]Amount of acreage disturbed during construction.
[b]Amount of acreage removed for the life of the project.
[c]Amount of acreage returned to preconstruction vegetation density upon completion of construction.
[d]0.7 miles new construction, 4.3 miles minor upgrading.
[e]25 feet of new width, which is in addition to the existing road.

TABLE 1-6
ALTERNATIVES: ACRES DISTURBED, REMOVED, AND RECLAIMED

Component	Length (Miles)	Construction Width (Feet)	Acres Disturbed[a]	Acres Removed[b]	Acres Reclaimed[c]
Middle Firehole Plant Process Water Pipeline Alternative					
Pipeline	20.4	50	124	0	124
Access Road	8.0	25	24	24	0
Power Transmission Line	14.0	20	34	0	34
Pump Station	NA	NA	1	1	0
TOTAL	42.4	NA	183	25	158
Jensen Slurry Water Supply Pipeline Alternative					
Pipeline	19.0	50	116	0	116
Power Transmission Line	0.6	20	1	0	1
Pump Station	NA	NA	1	1	0
TOTAL	19.6	NA	118	1	117
MAPCO Phosphate Slurry Pipeline Alternative					
Pipeline	96.3	50-60	601	0	601
(Segment A)	(50.5)	(50-60)	(316)	(0)	(316)
(Segment B)	(45.8)	(50-60)	(285)	(0)	(285)

TABLE 1-6
ALTERNATIVES: ACRES DISTURBED, REMOVED, AND RECLAIMED (concluded)

Component	Length (Miles)	Construction Width (Feet)	Acres Disturbed[a]	Acres Removed[b]	Acres Reclaimed[c]
Booster Pump Station	NA	NA	3	3	0
Power Substation	NA	NA	1	1	0
Power Transmission Line	7.5	20	18	0	18
Microwave System	NA	NA	1	1	0
TOTAL	103.8	NA	624	5	619
Northwest Phosphate Slurry Pipeline Alternative					
Pipeline	88.1	50-60	557	0	557
(Segment A)	(42.3)	(50-60)	(272)	(0)	(272)
(Segment B)	(45.8)	(50-60)	(285)	(0)	(285)
Booster Pump Station	NA	NA	3	3	0
Power Substation	NA	NA	1	1	0
Power Transmission Line	7.5	20	18	0	18
Microwave System	NA	NA	1	1	0
TOTAL	95.6	NA	580	5	575
Willow Creek Phosphate Sluury Pipeline Alternative					
Pipeline	96.8	50-60	604	0	604
(Segment A)	(51.0)	(50-60)	(319)	(0)	(319)
(Segment B)	(45.8)	(50-60)	(285)	(0)	(285)
Booster Pump Station	NA	NA	3	3	0
Power Substation	NA	NA	1	1	0
Power Transmission Line	7.5	20	18	0	18
Microwave System	NA	NA	1	1	0
TOTAL	104.3	NA	627	5	622

[a]Amount of acreage disturbed during construction.
[b]Amount of acreage removed for the life of the project.
[c]Amount of acreage returned to preconstruction/vegetation density upon completion of construction.

TABLE 1-7
CONSTRUCTION AND OPERATION PEAK WORK FORCE

Component	Construction	Year	Operation	Year
Plant Complex	900	1984-85	386	1986
Plant Power Substation and Plant Power Transmission Line	Local Pacific Power and Light work force			
County Road Relocation and Railroad Spur	67	1984	County	NA
Davis Bottom Plant Process Water Pipeline, Red Creek Canyon Phosphate Slurry Pipeline, and Phosphate Slurry Booster Pump Station	137	1984	6	1985
Booster Pump Station, Power Transmission Lines, Booster Pump Station, and Power Substation	Local Pacific Power and Light work force			

NA = not applicable

TABLE 1-8
CHEMICALS USED IN THE PHOSPHATE FERTILIZER PLANT

Chemical	Use	Frequency of Use	Quantity* Average	Quantity* Maximum
Diatomaceous earth	To precoat the filter in MgO removal sections	Intermittent-3,500 pounds/ batch, 1 batch/ 14.5 hrs for each of 3 filters	725	--
Sodium chlorate	To bleach the superphosphoric acid product	Continuous	20	35
Defoamer	To prevent foaming in the phosphoric acid plant reactor	Continuous	250	300
	To prevent foaming in the phosphoric acid and superphosphoric acid evaporators	Continuous	55	80

TABLE 1-8
CHEMICALS USED IN THE PHOSPHATE FERTILIZER PLANT (concluded)

Chemical	Use	Frequency of Use	Quantity* Average	Quantity* Maximum
	To prevent foaming in the granulation plant neutralizer	Continuous	Approximately 500 gpd	Approximately 600 gpd
Flocculent	To improve filtration of the gypsum on the phosphoric acid plant filters	Continuous	5	6
Sulfuric acid	To clean the phosphoric acid plant evaporators	Intermittent	100 gpm	—
Coating agent	To coat the granulated fertilizer	Continuous	Approximately 500 gpm	Approximately 600 gpd
Betz 430 Betz 2020 Biocides	Water treatment for cooling tower water and sulfuric acid plant	Continuoue	6 11 Enough to control algae in water	— —
Sulfuric acid	Boiler		Enough to maintain pH of 6.8 to 7.2	—

Source: Chevron 1982a.
*Pounds per hour unless otherwise noted.
Note: MgO = Magnesum Oxides; gpd = gallons per day; gpm = gallons per minute.

TABLE 1-9
EXPECTED TRACE METAL CONSTITUENTS OF WATER IN THE GYPSUM IMPOUNDMENT

Constituent	Estimated Concentration[a]
pH	2.5
Arsenic	less than 0.04
Barium	0.5
Cadmium	0.03
Chromium	7.0

TABLE 1-9
EXPECTED TRACE METAL CONSTITUENTS OF WATER IN THE GYPSUM IMPOUNDMENT (concluded)

Constituent	Estimated Concentration[a]
Copper	2.0
Iron	200.0
Lead	0.01
Manganese	2.0
Mercury	0.001
Selenium	less than 0.1
Silver	0.06
Zinc	2.0
Radium-226	8.0 pCi/l[b]

Source: Chevron 1982a

[a]Concentrations in milligrams per liter (mg/l) except for the pH and Radium-226 configurations.

[b]pCi/l = picoCuries per liter

TABLE 1-10
CHEMICALS CONSTITUENTS OF COOLING TOWER MISTS

	Estimated Concentration (ppm)*	
Elements	Sulfuric Acid Cooling Tower	Phosphoric Acid Cooling Tower
Fluorine	5	2,500
Chlorine	130	65
Phosphate	50	25
Sulfate	11,000	5,500
Total Carbon	450	225
Organic Carbon	25	11
Aluminum	1.5	1

TABLE 1-10
CHEMICALS CONSTITUENTS OF COOLING TOWER MISTS (concluded)

Elements	Estimated Concentration (ppm)* Sulfuric Acid Cooling Tower	Phosphoric Acid Cooling Tower
Boron	0.5	0.2
Barium	less than 0.2	less than 0.1
Calcium	1,620	810
Cadmium	less than 0.1	less than 0.05
Iron	less than 0.2	less than 0.1
Potassium	95	50
Magnesium	1,000	500
Sodium	2,080	1,040
Silica	60	30

Source: Chevron 1982a
*ppm = parts per million

TABLE 1-11
PROJECT AIR EMISSIONS

Emission Source	Pollutant	Controlled Emissions (pounds/hour)	(tons/year)
Phosphoric and Superphosphoric Acid Plant	F	1.62	7.10
Phosphoric Acid Plant Cooling Tower	F	7.95	34.84
Gypsum Pond	TSP	1.03	4.51
	F (Particulate)	0.01	0.02
Spring	F (Gas)	0.37	1.63
Summer	F (Gas)	0.52	2.29
Fall	F (Gas)	0.19	0.82
Winter	F (Gas)	0.14	0.60

TABLE 1-11
PROJECT AIR EMISSIONS (continued)

Emission Source	Pollutant	Controlled Emissions (pounds/hour)	Controlled Emissions (tons/year)
Steam Generating Plant	TSP	1.65	7.23
	SO_2	0.07	0.29
	CO	1.87	8.19
	VOC	0.33	1.45
	NO_x	20.02	87.69
Phosphate Rock Concentrate Dryers	TSP	6.25	27.38
	SO_2	0.05	0.24
	CO	1.53	6.70
	VOC	0.27	1.18
	NO_x	16.40	71.83
Phosphate Rock Concentrate Handling Baghouse	TSP	2.08	9.13
Phosphate Rock Railcar Load In	TSP	1.56	6.83
Phosphate Rock Railcar Dust Collector	TSP	0.77	3.37
Sulfuric Acid Plant	SO_2	583.33	2,555.00
	Acid Mist	21.89	95.81
	NO_x	80.00	350.40
Ammonium Phosphate Cooling Pond	F	0.009	0.04
Ammonia Phosphate Plant	F	3.00	13.14
	TSP	25.50	111.69
	SO_2	0.05	0.20
	CO	1.28	5.58
	VOC	0.23	0.99
	NO_x	13.80	60.44
Plant Site Roads	TSP	0.03	0.11
Road to Gypsum Pond	TSP	2.09	9.15
In-Plant Vehicles	TSP	0.003	0.01
	SO_2	0.001	0.01
	CO	0.49	2.14
	VOC	0.07	0.28
	NO_x	0.03	0.12

TABLE 1-11
PROJECT AIR EMISSIONS (concluded)

Emission Source	Pollutant	Controlled Emissions (pounds/hour)	(tons/year)
Railroad Traffic (secondary)	TSP	0.11	0.28
	SO_2	0.25	0.64
	CO	0.57	1.46
	VOC	0.41	1.05
	NO_x	1.62	4.14
Commuter Traffic (secondary)	TSP	1.39	6.11
	SO_2	0.06	0.26
	CO	24.89	109.00
	VOC	3.33	14.59
	NO_x	1.38	6.06
Truck Traffic (secondary)	TSP	0.11	0.19
	SO_2	0.04	0.08
	CO	0.16	0.29
	VOC	0.04	0.08
	NO_x	0.41	0.74
Ammonium Phosphate Rail Car Load In	TSP	0.34	1.49
Ammonium Phosphate Rail Car Dust Collector	TSP	0.17	0.74

Source: Wyoming Department of Environmental Quality 1982.

F = Fluorine; TSP = total suspended particulates; SO_2 = Sulfur dioxide; CO = Carbon monoxide; VOC = volatile organic carbon; NO_x = Nitrogen oxides.

TABLE 1-12
MILES OF FACILITIES NOT ADJACENT TO EXISTING ROADS OR OTHER RIGHTS-OF-WAY

Facility	Location by State: Utah	Wyoming
Plant Process Water Pipelines		
Davis Bottom (proposed action)		
Private	NA	6.4
BLM	NA	3.4
State of Wyoming	NA	0.0

TABLE 1-12
MILES OF FACILITIES NOT ADJACENT TO EXISTING ROADS OR OTHER RIGHTS-OF-WAY (continued)

Facility	Location by State Utah	Wyoming
Middle Fire Hole Alternative		
Private	NA	7.6
BLM	NA	4.8
State of Wyoming	NA	0.0
Forest Service	NA	0.7
Jensen Slurry Water Supply Alternative		
Private	0.6	NA
BLM	2.4	NA
State of Utah	0.7	NA
Phosphate Slurry Pipelines		
Red Creek Canyon (proposed action)		
Segment A		
Private	13.3	0.0
BLM	15.8	0.0
State of Utah	0.0	NA
State of Wyoming	NA	0.0
Segment B		
Private	NA	6.3
BLM	NA	4.7
State of Wyoming	NA	0.0
MAPCO Alternative		
Segment A		
Private	11.0	0.0
BLM	8.2	0.0
State of Utah	0.0	NA
State of Wyoming	NA	0.0
Northwest Alternative		
Segment A		
Private	9.7	0.0
BLM	12.1	0.0
State of Utah	0.0	NA
State of Wyoming	NA	1.1
Forest Service	2.9 (.9 NRA)	0.0

CHAPTER 2

ENERGY EFFICIENCY AND COMPARATIVE ANALYSIS

The energy efficiencies and environmental impacts of the proposed action and alternatives are compared in this chapter. The component alternatives compared in this chapter are the Middle Firehole water pipeline, the Jensen slurry water supply pipeline and the MAPCO, Northwest, and Willow Creek phosphate slurry pipelines.

2.1 ENERGY EFFICIENCY

The plant would require commercial power for start-up, but would then switch to on-site generated power from the sulfuric acid plant

Transportation of the slurry requires energy. For the proposed action, there would be two main energy consumers: two 1,400-horsepower pumps located at the mine site and two 1,100-horsepower pumps located at the booster pump station. Additively, these pumps would require 12,730,452 British thermal units (Btu's) per hour. Table 2-1 compares the Red Creek Canyon phosphate slurry pipeline route with the alternative routes based on Btu's consumed during each hour of pumping. No calculations were made for frictional or head differences; the comparison is simply based upon length.

Similarly, energy would be required to pump water from the various water sources (Davis Bottom, Middle Firehole, and Jensen). The Btu demand for these water sources is shown in Table 2-2.

Depending on which system components are used, the Btu's required to operate the water supply system and deliver the slurry could range from a low of 14,603,725 per hour (the Northwest alternative and the Davis Bottom water supply), to a high of 20,171,719 (the Red Creek Canyon pipeline and the Jensen and Middle Firehole alternatives)

2.2 COMPARATIVE ANALYSIS

2.2.1 Middle Firehole PlantProcess Water Pipeline Alternative

The Middle Firehole process water pipeline, with related facilities, would be 4 miles longer than the Davis Bottom route, and therefore, would result in slightly more acreage disturbance. These impacts are identified by component and resource as indicated in Table 2-3.

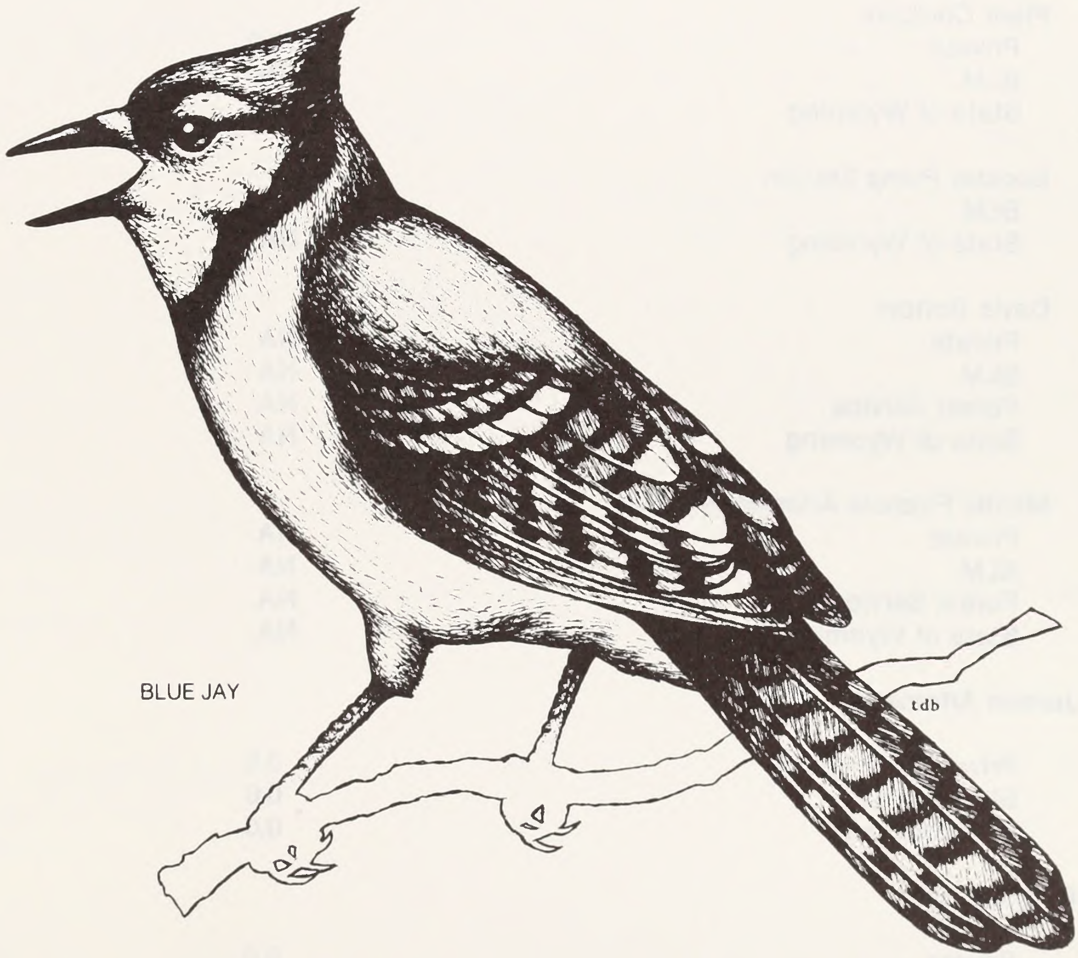
TABLE 2-1
ENERGY EFFICIENCY COMPARISON OF THE RED CREEK CANYON PHOSPHATE SLURRY PIPELINE WITH THE ALTERNATIVES

Pipeline	Length in Miles	Btu per Mile	Total Btu per Hour
Red Creek Canyon	98.2	129,638	12,730,452
MAPCO	96.3	129,638	12,484,139
Northwest	88.1	129,638	11,421,108
Willow Creek	96.8	129,638	12,548,958

*British thermal units (Btu's) determined as follows: horsepower × 746 kilowatts/horsepower × 3,413 Btu/kilowatt hour.

CHAPTER II

ENERGY EFFICIENCY AND COMPARATIVE ANALYSIS



BLUE JAY

TABLE 1-12
MILES OF FACILITIES NOT ADJACENT TO EXISTING ROADS OR OTHER RIGHTS-OF-WAY (continued)

Facility	Location by State Utah	Wyoming
Willow Creek Alternative		
Segment A		
Private	11.0	0.0
BLM	12.2	0.0
State of Utah	0.0	NA
State of Wyoming	NA	0.0
Power Transmission Lines		
Plant Complex		
Private	0.0	4.7
BLM	0.0	2.3
State of Wyoming	NA	0.0
Booster Pump Station		
BLM	0.0	6.5
State of Wyoming	NA	1.0
Davis Bottom		
Private	NA	3.0
BLM	NA	2.0
Forest Service	NA	0.2
State of Wyoming	NA	0.8
Middle Firehole Alternative		
Private	NA	2.0
BLM	NA	2.3
Forest Service	NA	0.7
State of Wyoming	NA	0.0
Jensen Alternative		
Private	0.6	0.0
BLM	0.0	0.0
State of Utah	0.0	NA
Railroad Spur		
Private	0.0	4.5
BLM	0.0	4.2
State of Wyoming	NA	0.0

TABLE 1-12
MILES OF FACILITIES NOT ADJACENT TO EXISTING ROADS OR OTHER RIGHTS-OF-WAY (concluded)

Facility	Location by State Utah	Wyoming
County Road Relocation		
Private	0.0	1.0
BLM	0.0	1.5
State of Wyoming	NA	0.0

TABLE 2-2
ENERGY EFFICIENCY COMPARISON OF THE WATER PIPELINES WITH THE ALTERNATIVES

Pipeline	Length in Miles	Btu* per Mile	Total Btu per Hour
Davis Bottom	16.4	194,062	3,182,617
Middle Firehole	20.4	187,213	3,819,145
Jensen	19	190,638	3,622,122
Tailings Pond**	0	0	0

*British thermal units (Btu's) determined as follows: horsepower × 746 kilowatts/horsepower × 3,413 Btu/kilowatt hour
**Existing pond; no new impacts are anticipated from implementation of the proposed action.

TABLE 2-3
PROCESS WATER SUPPLY PIPELINE COMPARATIVE ANALYSIS

ELEMENT	PROPOSED ACTION (DAVIS BOTTOM)	MIDDLE FIREHOLE ALTERNATIVE
TOTAL LENGTH OF PROCESS WATER PIPELINE COMPONENTS – Miles		
Pipeline	16.4	20.4 (+4.0)
Power Transmission Line	10.0	14.0 (+4.0)
Access Road	5.0	8.0 (+3.0)
ENERGY USED – Btu's/Hour	3,182,617	3,819,145 (+636,528)
WILDLIFE		
Deer Habitat Loss - Acres		
"Normal" Winter Range		
Short-Term	53	109 (+56)
Long-Term	11	13 (+2)
Year long Range		
Short-Term	81	49 (−32)

TABLE 2-3
PROCESS WATER SUPPLY PIPELINE COMPARATIVE ANALYSIS (continued)

ELEMENT	PROPOSED ACTION (DAVIS BOTTOM)	MIDDLE FIREHOLE ALTERNATIVE
Long-Term	5	12 (+7)
Elk Habitat Loss - Acres		
"Normal" Winter Range		
Short-Term	26	47 (+21)
Long-Term	15	18 (+3)
Pronghorn Habitat Loss - Acres		
"Normal" Winter Range		
Short-Term	86	122 (+36)
Long-Term	19	24 (+5)
Year long Range		
Short-Term	14	36 (+22)
Long-Term	21	1 (−20)
Sagegrouse Habitat Loss - Acres		
General Distribution Range		
Short-Term	9	34 (+25)
Long-Term	9	17 (+8)
Whitetail Prairie Dog Habitat Loss - Acres		
General Distribution Range		
Short-Term	18	34 (+16)
Long-Term	9	17 (+8)

TABLE 2-5
PHOSPHATE SLURRY PIPELINE COMPARATIVE ANALYSIS

ELEMENT	PROPOSED ACTION (Red Creek Canyon)	MAPCO ALTERNATIVE	NORTHWEST ALTERNATIVE	WILLOW CREEK ALTERNATIVE
TOTAL LENGTH (A + B) OF SLURRY PIPELINE - Miles	98.2	96.3 (– 1.9)	88.1 (– 10.1)	96.8 (– 1.4)
ENERGY USE - Btu's/hour	12,730,452	12,484,139 (– 246,313)	11,421,108 (– 1,309,344)	12,548,958 (– 181,494)
WATER RESOURCES				
Water Quality of Green River Affected:				
Little Hole to Red Creek (but not including Red Creek)	None	None	River crossing 1,200 mg/l at 50 feet 140 mg/l at 100 feet 3 mg/l at 200 feet	None
Red Creek to Brown's Park	River crossing 1,200 mg/l at 50 feet 140 mg/l at 100 feet 3 mg/l at 200 feet plus some unquantifiable amount from Red Creek during construction	River crossing 1,200 mg/l at 50 feet 140 mg/l at 100 feet 3 mg/l at 200 feet	None	River crossing 1,200 mg/l at 50 feet 140 mg/l at 100 feet 3 mg/l at 200 feet
TRANSPORTATION NETWORKS				
Significant Interference to:				
Roads	None	(+ Jesse Ewing Canyon road 3 miles)	(+ Little Hole campground road, 0.5 miles)	(+ Jesse Ewing Canyon road, 1 mile)
Pipelines	None	(+ MAPCO, 3 miles)	(+ Northwest, 0.25 miles)	(+ MAPCO, 1 mile)
WILDLIFE				
Mule Deer Habitat Loss - Acres				
Critical Winter Range				
Short-Term	209	209 (0)	183 (– 26)	209 (0)
Long-Term	4.25	4.25 (0)	4.25 (0)	4.25 (0)
Normal Winter Range				
Short-Term	211	211 (0)	211 (0)	211 (0)
Long-Term	0.75	0.75 (0)	0.75 (0)	0.75 (0)
Summer Range				
Short-Term	81	81 (0)	81 (0)	81 (0)
Long-Term	0	0	0	0
Yearlong Range Long-Term	0.50	0.50 (0)	0.50 (0)	0.50 (0)

TABLE 2-5
PHOSPHATE SLURRY PIPELINE COMPARATIVE ANALYSIS (continued)

ELEMENT	PROPOSED ACTION (Red Creek Canyon)	MAPCO ALTERNATIVE	NORTHWEST ALTERNATIVE	WILLOW CREEK ALTERNATIVE
Elk Habitat Loss - Acres				
Normal Winter Range				
Short-Term	358	340 (−18)	345 (−13)	331 (−27)
Long-Term	4.50	4.50 (0)	4.50 (0)	4.50 (0)
Pronghorn Habitat Loss - Acres				
Critical Winter Range				
Short-Term	65	115 (+50)	77 (+12)	115 (+50)
Long-Term	3	3 (0)	3 (0)	3 (0)
Normal Winter Range				
Short-Term	142	142 (0)	142 (0)	142 (0)
Long-Term	0	0	0	0
Summer Range				
Short-Term	119	119 (0)	119 (0)	119 (0)
Long-Term	0	0	0	0
Yearlong Range				
Short-Term	31	24 (−7)	24 (−7)	24 (−7)
Long-Term	1.25	1.25 (0)	1.25 (0)	1.50 (0)
Sagegrouse Habitat Loss - Acres				
Short-Term	375	375 (0)	375 (0)	375 (0)
Long-Term	0.25	0.25 (0)	0.25 (0)	0.25 (0)
Prairie Dog Habitat Loss - Acres				
Short-Term	119	119 (0)	119 (0)	119 (0)
Long-Term	0	0	0	0
VISUAL RESOURCES*				
Acres Affected				
VRM Class II	64	52 (−12)	40 (−24)	52 (−12)
VRM Class IV	3	3 (0)	3 (0)	3 (0)
VQO R	0	0	24 (+24)	0

TABLE 2-4
SLURRY WATER SUPPLY PIPELINE COMPARATIVE ANALYSIS (continued)

ELEMENT	PROPOSED ACTION (TAILINGS POND)	JENSEN ALTERNATIVE
WILDLIFE		
Conflicts with Squawfish Spawning Areas	0	Intake structure
Deer Habitat Loss - Acres		
Short-Term	0	36 (+36)
Ring-Necked Pheasant Habitat Loss - Acres		
Short-Term	0	43
Long-Term	0	1 (+1)
VISUAL RESOURCES*		
Acres Significantly Affected		
VRM Class II	0	3
VRM Class IV	0	1
SOILS AND VEGETATION		
Acres Disturbed/Duration	0	118/1 year (+118/1 year)
Acres Removed/Duration	0	1/30 years (+1/30 years)
Acres Reclaimed	0	117 (+117)
Acres of "Sensitive Areas" **	0	78 (+78)
AGRICULTURE		
Grazing Loss AUM/Duration	0	4/2 to 10 years (+4/2 to 10 years)
Farming Loss Acres/Duration	0	6.0/1 year (+6.0/1 year)

TABLE 2-4
SLURRY WATER SUPPLY PIPELINE COMPARATIVE ANALYSIS (concluded)

ELEMENT	PROPOSED ACTION (TAILINGS POND)	JENSEN ALTERNATIVE
HEALTH AND SAFETY		
Related to Miles of Construction	0	+20 (+20)

Note: Btu = British thermal units; AUM = animal unit month; cfs = cubic feet per second.
Figures indicated inside parentheses are the difference between the proposed action and the alternative.
– indicates less than the proposed action; + indicates more than.
*Refer to Appendix 6 for definitions of terms.
**Refer to Chapter 4, Section 4.2.11, for definition and description of sensitive areas.

2.2.3 Phosphate Slurry Pipeline Alternatives

MAPCO

This route would be 1.9 miles shorter than the Red Creek Canyon (proposed action) route which slightly reduces most of the impacts that would be incurred from implementation of the proposed action. (These impacts are compared in Table 2-5.) This route would pass through three key issue areas: Rye Grass Draw, Jesse Ewing Canyon, and Red Creek Basin Escarpment; the proposed action would pass through Rye Grass Draw, Red Creek Canyon, and Red Creek Basin Escarpment.

The only major difference between the MAPCO and proposed action routes is that the alternative would follow the existing MAPCO alignment through Jesse Ewing Canyon. The proposed action would follow Red Creek Canyon out of Brown's Park into Clay Basin, thus adding some unquantifiable additional sediment to Red Creek and the Green River for a 1-year period. The proposed action alignment would be in conflict with the BLM Management Framework Plan, whereas the alternative would not. However, the alternative route would conflict with the existing road and MAPCO pipeline alignments.

Impacts for the following resources would be the same for this alternative as those detailed in the proposed action section for the Red Creek Canyon phosphate slurry pipeline: socioeconomics, air quality, recreation, cultural resources, and health and safety. Resources that have different impacts because of the alternative alignment through Jesse Ewing Canyon are identified in the following resource discussions.

Water Resources: The alternative would exit Brown's Park through Jesse Ewing Canyon instead of Red Creek Canyon (proposed action). Therefore, the impacts to water quality in the Brown's Park area would be somewhat less than the proposed action since there would not be the impact of additional sediments from Red Creek Canyon.

Tansportation Networks: The MAPCO alternative would significantly affect the county road and MAPCO pipeline in Jesse Ewing Canyon; the proposed action route would not affect these alignments. If the alternative were implemented, the county road and pipeline may have to be realigned to accommodate the new pipeline.

Wildlife: The alternative would disturb 18 less acres of short term, normal winter elk range than the proposed action. However, 50 more acres of short-term critical pronghorn range would be disturbed by this alternative. All other wildlife habitat losses would be the same as indicated for the proposed action.

TABLE 2-3
PROCESS WATER SUPPLY PIPELINE COMPARATIVE ANALYSIS (concluded)

ELEMENT	PROPOSED ACTION (DAVIS BOTTOM)	MIDDLE FIREHOLE ALTERNATIVE
VISUAL RESOURCES*		
Acres Affected		
VRM Class II	0	2 (+2)
VRM Class III	7	25 (+18)
VRM Class IV	0	10 (+10)
VQO R	2	7 (+5)
Height of Microwave Tower	50 feet	150 feet (+100 feet)
SOILS AND VEGETATION		
Acres Disturbed/Duration	140/1 year	183/1 year (+43/1 year)
Acres Removed/Duration	16/30 years	25/30 years (+9/30 years)
Acres Reclaimed	124	158 (+34)
Acres of "Sensitive Acres" **	100	124 (+24)
AGRICULTURE		
Grazing Loss AUM/Duration	5/2 to 5 years	6/2 to 5 years (+1/2 to 5 years)

Note: Btu = British thermal units; AUM = animal unit month.
Figures indicated inside parenteheses are the difference between the proposed and the alternative.
– indicates less than the proposed action; + indicates more than.
*Refer to Appendix 6 for definitions of terms.
**Refer to Chapter 4, Section 4.2.11, for definition and description of sensitive areas.

In addition to these small increases, there would be a significant increase in visual impact due to the 150-foot high microwave tower, compared with the 50-foot high tower proposed at Davis Bottom.

Impacts for the following resources would be the same for this alternative as those detailed in the proposed action section for the Davis Bottom plant process water pipeline: water resources, socioeconomics, transportation networks, air quality, land use plans, recreation, cultural resources, health and safety. Impacts that would be different are identified in the following resource discussions.

Wildlife: All wildlife habitat losses would be greater from implementation of this alternative than those identified for the proposed action, except that long-term, yearlong pronghorn habitat losses would be less than those indicated for the proposed action.

Visual Resources: Acres that would be affected by implementation of this alternative for Visual Resource Management (VRM) Classes II, III, and IV and Visual Quality Objectives (VQO) Class R, would all be greater than those identified for the proposed action. In addition, the 150-foot microwave tower at Middle Firehole would have a greater viewing impact than the 50-foot tower proposed at Davis Bottom.

Soils and Vegetation: Acres disturbed, removed, and reclaimed, and sensitive acres that would be disturbed from implementation of this alternative, would all be greater than those identified for the proposed action.

Agriculture: Grazing losses from implementation of the Middle Firehole alternative would be 1 animal unit month (AUM) more per year for 2 to 5 years than the losses indicated for the proposed action route.

2.2.2 Jensen Slurry Water Supply Alternative

Since the proposed action would use an existing tailings pond as its source of water supply, no new impacts are anticipated. However, implementation of the Jensen alternative would involve the creation of all new and additional impacts as compared with the proposed action. These impacts are identified on Table 2-4.

TABLE 2-4
SLURRY WATER SUPPLY PIPELINE COMPARATIVE ANALYSIS

ELEMENT	PROPOSED ACTION (TAILINGS POND)	JENSEN ALTERNATIVE
TOTAL LENGTH OF SLURRY WATER PIPELINE - Miles		
Pipeline	0	19.0 (+19.0)
Power Transmission line	0	0.6 (+0.6)
ENERGY USE - Btu's/Hour	0	3,622,122 (+3,622,122)
WATER RESOURCES		
Change in Green River cfs	0	4 (+4 from Flaming Gorge Dam to Jensen)

TABLE 2-5
PHOSPHATE SLURRY PIPELINE COMPARATIVE ANALYSIS (concluded)

ELEMENT	PROPOSED ACTION (Red Creek Canyon)	MAPCO ALTERNATIVE	NORTHWEST ALTERNATIVE	WILLOW CREEK ALTERNATIVE
LAND USE PLANS				
Conflicts with BLM MFPs Miles of Pipeline	10	0 (−10)	5 (−5)	4 (−6)
Conflicts with FS Flaming Gorge NRA Management Plan Miles of Pipeline	0	0	2.9 (+2.9)	0
RECREATION RESOURCES				
Major Areas Affected Short Term	None	None	+ Flaming Gorge NRA Little Hole Campground	None
SOILS AND VEGETATION				
Acres Disturbed/Duration	640/1 year	624/1 year (−16/1 year)	580/1 year (−60/1 year)	627/1 year (−13/1 year)
Acres Removed/Duration	5/30 years	5/30 years (0)	5/30 years (0)	5/30 years (0)
Acres Requiring Reclamation	635	619 (−16)	575 (−60)	622 (−13)
Acres of "Sensitive Areas" **	214	211 (−3)	242 (+28)	216 (+2)
AGRICULTURE				
Grazing Loss - AUM/2-5 years	32	31 (−1)	29 (−3)	31 (−1)

Note: MFP's = Management Framework Plan; FS = Forest Service; AUM = animal unit month; mg/l = milligrams per liter; NRA = National Recreation Area.
Figures indicated inside parentheses are the difference between the proposed acton and the alternative.
− indicates less than the proposed action; + indicates more than.
*Refer to Appendix 6 for definitions of terms.
**Refer to Chapter 4, Section 4.2.11, for definition and description of sensitive areas.

Visual Resources: The only difference between this alternative and the proposed action is that 12 less acres of VRM Class II would be disturbed by implementation of the alternative.

Land Use Plans: This alternative would not conflict with the BLM Vernal District Management Framework Plan which restricts the location of new pipelines, as would the proposed action. The proposed action would affect 10 miles of land that would be in conflict with this plan; the alternative would affect none.

Soils and Vegetation: This alternative would disturb 16 less acres than the proposed action, and would cross 3 less acres identified as sensitive.

Agriculture: Grazing losses from implementation of the MAPCO alternative would be 1 AUM less per year for 2 to 5 years than the proposed action.

Northwest

This route would be about 10 miles shorter than the proposed action route; therefore, most of the impacts would be less as indicated in Table 2-5. However, the alternative would cross 4.7 more miles of sensitive areas (Refer to Chapter 4, Section 4.2.11) than the proposed action, resulting in the disturbance of 28 more acres of sensitive areas. Of major importance, however, is the fact that this alternative is in conflict with the law, intent, and purpose for which Congress established the Flaming Gorge National Recreation Area.

This route would only cross two key issue areas: Goslin Mountain and Red Creek Basin Escarpment, whereas the proposed action would cross three: Rye Grass Draw, Red Creek Canyon, and Red Creek Basin Escarpment.

Impacts for the following resources would be the same for this alternative as those detailed in the proposed action section for the Red Creek Canyon phosphate slurry pipeline: socioeconomics, air quality, recreation, cultural resources, and health and safety. Impacts that would be different are identified in the following resource discussions.

Water Resources: This route would cross the Green River at Little Hole Campground and proceed around Goslin Mountain into Clay Basin. Since the Northwest alternative would not traverse Red Creek Canyon, this route would not have the impacts that are associated with the proposed action route.

Transportation Networks: This route would interfere with the road to Little Hole Campground and could possibly interfere with the operation of the existing Northwest pipeline; the proposed action would not affect these areas.

Wildlife: The Northwest alternative would disturb 26 less acres of short-term, critical winter mule deer range and 13 less acres of short-term, normal winter elk range and yearlong pronghorn range than the Red Creek Canyon pipeline. However, short-term losses to critical winter pronghorn range would be 12 acres more. All other wildlife habitat losses would be the same as indicated for the proposed action.

Visual Resources: This alternative would disturb 24 less acres of VRM Class II land than the proposed action. However, the alternative would disturb 24 acres of VQO Class R, Forest Service National Recreation Area land, whereas the proposed action would not.

Land Use Plans: This alternative would conflict with the BLM Vernal District Management Framework Plan which restricts the location of new pipelines. About 5 miles of pipeline would be in conflict, but this is 5 miles less conflict than the proposed action route. However, the alternative would affect 2.9 miles within the Flaming Gorge National Recreation Area which conflicts with the Flaming Gorge National Recreation Area Management Plan.

Recreation: This route would affect the use of the Little Hole Campground while the proposed action would not.

Soils and Vegetation: This alternative would disturb 60 less acres than the proposed action; however, 24 more acres of sensitive areas would be disturbed by implementation of this alternative compared with the proposed action.

Agriculture: Grazing losses from implementation of the Northwest alternative would be 3 AUM's less per year for 2 to 5 years than the proposed action.

Willow Creek

This alternative would be the same as the MAPCO alternative, except it would avoid the steep lower section of Jesse Ewing Canyon. This route would pass through three key issue areas and a portion of a fourth: Rye Grass Draw, Willow Creek, Red Creek Basin Escarpment, and the north portion of Jesse Ewing Canyon as compared with the three identified for the proposed action route. (Refer to discussion of the Northwest alternative.)

Impacts for the following resources would be the same for this alternative as those detailed in the proposed action section for the Red Creek Canyon phosphate slurry pipeline: socioeconomics, air quality, recreation, cultural resources, and health and safety. Resources that would have different impacts from those indicated for the proposed action are identified in the following resource discussions.

Water Resources: This route would exit Brown's Park to the east of Jesse Ewing Canyon instead of Red Creek Canyon. Therefore, the impacts to water quality in the Brown's Park area would be somewhat less than the proposed action since there would not be the additional sediment load from Red Creek Canyon.

Transportation Networks: This alternative would have significant impacts to the county road and MAPCO pipeline for about 1 mile at the north end of Jesse Ewing Canyon; the proposed action route would have none.

Wildlife: The Willow Creek alternative would disturb 50 more acres of short-term, critical winter pronghorn range than the proposed action. However, less than 27 acres of winter elk range would be disturbed. All other wildlife habitat losses would be the same as indicated for the proposed action.

Visual Resources: This alternative, like the MAPCO alternative, would disturb 12 less acres of VRM Class II land than would the proposed action.

Land Use Plans: This alternative would conflict with the BLM Vernal District Management Framework Plan which restricts the location of new pipelines. About 4 miles of pipeline would be in conflict, but this is 6 miles less conflict than the proposed action.

Soils and Vegetation: This alternative would disturb 13 less acres than the proposed action; however, 2 more acres of sensitive area would be disturbed by this alternative compared with the proposed action.

Agriculture: Grazing losses would be 1 AUM less per year for 2 to 5 years than the proposed action.

CHAPTER III

AFFECTED ENVIRONMENT

INDIAN RICE GRASS

CHAPTER 3
AFFECTED ENVIRONMENT

The affected environment for the Chevron Phosphate Fertilizer Complex is that portion of the existing environment that would be affected by the proposed action or alternatives. This chapter provides only information about the environment that would be significantly affected by the project as determined by the impact analysis presented in Chapter 4. No wetlands or prime agricultural land would be affected by implementation of the proposed action or alternatives.

3.1 IMPACT AREA OF INFLUENCE

3.1.1 Water Resources

The portion of the project area that could experience direct impacts lies in the Upper Colorado River Basin, specifically in the Green River Basin in the areas of the Fontenelle and Flaming Gorge reservoirs. Secondary impacts associated with water use from this area will be noticed throughout the Colorado River System.

3.1.2 Socioeconomics

The socioeconomic environment that would be most affected by the proposed action encompasses Sweetwater County, Wyoming, the towns of Rock Springs and Green River, and Uintah and Daggett counties in Utah. Socioeconomic considerations include population, employment and income, facilities and services, education, housing, fiscal and sociological conditions.

3.1.3 Transportation Networks

The primary area of influence for transportation networks includes those existing networks (road, rail, pipeline, or air) that would be disrupted as a result of the proposed action in Sweetwater County, Wyoming, and Uintah and Daggett counties, Utah.

3.1.4 Air Quality

The project area lies within the Wyoming and Utah Intrastate Air Quality Control Regions (AQCR) as designated by the EPA.

3.1.5 Wildlife

The affected area for wildlife would include areas that would be directly affected (i.e., areas disturbed by construction of facilities) and areas that would be indirectly affected (i.e., an area surrounding the facilities that would affect wildlife as a result of human activity during construction, operation, and maintenance activities).

For all linear facilities, the area that would be directly affected would vary with the width required for construction (50 to 150 feet wide). For site facilities, it would be the area directly required for the site (e.g., 1 acre for the water intake structure and pump station). For the Green River crossing, the area that would be directly affected would be the 1.5 acres required for staging on each bank of the river and the width of the trench in the river bottom. For the river in-stream diversion structure, the affected area during construction would also include the area directly downstream from the sites since construction sediments would travel to settle in this area.

The areas that would be indirectly affected would be those surrounding each project facility. These would be unusable by wildlife because of isolation, noise, dust, and similar factors. This affected area would vary with the amount of activity occurring and the species of wildlife involved, as each species has a different human tolerance level. The amount of area that would be affected cannot be quantified due to a lack of data and research to establish these limits by species. Areas subject to any stream depletion or change in water quality would indirectly affect aquatic life.

3.1.6 Visual Resources

The impact area of influence for visual resources includes all areas which would be disturbed during construction, operation, or maintenance of the proposed action and alternatives. Disturbances may be caused by modifying the landform, clearing vegetation, and/or placing structures upon the landscape. Under certain circumstances, areas from which such disturbances are viewed could also be included in the impact area of influence (such as wilderness areas), as could modifications to the landscape which would be caused by secondary impacts (such as infrastructure expansion).

3.1.7 Recreation Resources

The primary area of influence includes all developed recreation facilities and dispersed recreation areas between Vernal, Utah, to the south; Rock Springs, Wyoming, to the north; the western boundary of the Flaming Gorge National Recreation Area (NRA) to the west; and the Utah/Colorado state line and Wyoming State Highway 430 to the east

3.1.8 Wilderness

The area of influence for wilderness resources includes the Red Creek Badlands Wilderness Study Area (WSA)

3.1.9 Cultural Resources

The affected area for cultural resources would be any area directly disturbed by construction activity and used by the construction work force, or any area that would be affected by increased use from the increased population associated with construction or operation of the proposed action.

3.1.10 Soils and Vegetation

For linear facilities, the impact area of influence was determined to be the width of the right-of-way disturbance. The impact area for surface facilities would be the actual acreage covered by the facility including any surrounding fenced area.

3.1.11 Agriculture

The impact area of influence for agriculture would be the same as indicated for soils and vegetation.

3.2 PROPOSED ACTION

3.2.1 Water Resources

The affected environment for water resources is similar for all components of the proposed action (fertilizer plant, Davis Bottom plant process water pipeline, Red Creek Canyon phosphate slurry pipeline, railroad spur, power substations, power transmission lines, microwave system, county road relocation). Therefore, the description is not separated by project component.

The project area lies in a region that is characterized by high flows and low dissolved solids during snowmelt (May, June, and July), and low flow and high dissolved solids from September through February when ground water becomes the primary contributor to flow. The Green River is the major river in the project area. Within its basin, there are 24 reservoirs that have more than 1,000 acre-feet of storage. The two largest reservoirs are Fontenelle and Flaming Gorge with 190,000 and 3,516,000 acre-feet of active capacity respectively. Both of these reservoirs help to regulate the flow along the Green River.

The Green River has a drainage area of 44,850 square miles, including arid grasslands and moist, wooded mountains. Because of this, extreme daily discharges range from 68,100 cubic feet per second (cfs) to 255 cfs, averaging 6,298 cfs. However, since the construction of Flaming Gorge Reservoir, these extremes have been moderated. The Green River has an average annual discharge of 4,563,000 acre-feet at Green River, Utah.

Water quality parameters also vary widely. The maximum sediment discharge on record is 2,230,000 tons per day (TPD) and the minimum is 54, with a total of 10,281,496 tons identified for the 1980 water year. According to U.S. Geological Survey records, tributary streams in the project area show similar variations in flow and quality except that the discharge is much less and the streams often dry up.

A tributary system of special interest is the Red Creek Watershed which has been the subject of a cooperative watershed study by the Bureau of Land Management (BLM) and U.S. Geological Survey. The study categorizes the watershed as an area of unstable soils and highly dissected topography. This, in combination with over-grazing and human activities (oil and gas drilling, pipeline construction, and road construction), may have increased sediment contribution from the Red Creek Watershed to the Green River.

The watershed was studied for 5 years, the results of which are summarized in the Red Creek Watershed Management Plan (BLM 1981c). The study indicates that flows range from 0 cfs to 1,440 cfs and the annual sediment contribution to the Green River is estimated to be over 100,000 tons. The watershed can be divided into three unique landforms: Red Creek Canyon, MP A42 to A43; Red Creek Basin, from the head of the canyon to the base of the escarpment, MP A43 to B5; and Red Creek Basin Escarpment, MP B5 to B7.

Red Creek Canyon is a narrow canyon that is partially filled with alluvium. The alluvium ranges from fine sands to gravel and boulders. The stream in this area meanders through these materials causing erosion in places and depositing materials in others. The lack of fine materials (silt and clay) in the alluvium indicates that there is sufficient energy and turbulence in this reach to transport these materials to the Green River.

Red Creek Basin, from the head of the canyon to the base of the escarpment, is a highly dissected plain. It is covered with alluvial materials that have been transported from the surrounding uplands and deposited on this plain. The materials are primarily in the silt, fines, and particle size range. Due to the lack of vegetation, they are in a state that is continually ready for transport. This area is the primary sediment contributing landform in the Red Creek Watershed.

On the Red Creek Basin Escarpment, there is approximately 1 mile of construction on a 40 to 60 percent sideslope. Trenching through this area would disturb 230,000 tons of material. The materials are interbedded mudstone, fine to coarse grained sandstone, and thin beds of shales and limestones, which in their natural state, are highly erodible.

There are also two areas on the Red Creek Basin Escarpment which are abnormally wet due to runoff from U.S. Highway 191. There are no records of any flowing water from these areas. In addition to this, there are several known occurrences of springs and wet spots along the various pipeline routes (Map A4-1 and Maps A4-3 through A4-6). Currently these water sources are used by livestock and wildlife. In addition, moisture supplied by these water sources support additional vegetation.

There is one major floodplain in the project area; it is occupied by the Green River. For most of its length, such as at Davis Bottom, the floodplain occupies a very small area which is actually part of Flaming Gorge Reservoir, which is constricted by canyons except where the Green River enters Brown's Park. The floodplain widens as much as 2 miles in this area. Because of the flood control provided by Flaming Gorge Reservoir, there are no longer any floods within this floodplain. All other drainages in the project area have floodplains that are of little basin-wide consequence.

3.2.2 Socioeconomics

Due to the expected settlement patterns of the Chevron work force, the affected socioeconomic environment pertains to all the proposed project components; therefore, the socioeconomic analysis has not been separated by component. The following discussion emphasizes the socioeconomic conditions of Sweetwater County, Wyoming, since that area would be most affected in terms of socioeconomic patterns.

Population

Because of mineral and energy development, the population of the Sweetwater and Uintah counties has increased dramatically since 1970. Population is expected to continue to increase in the 1980's, as shown in Table 3-1, but at a much lower rate than in the 1970's. This lower rate reflects the slowdown of the economy in those areas that caused the increase in the 1970's. For Sweetwater County, the increase between 1980 and 1990 is expected to be 16 percent, compared to the 127 percent increase that occurred in the 1970's, while the population of Uintah County is projected to increase 42 percent during the same period, compared to the 62 percent increase that occurred in the 1970's. The 1980 population figure for Daggett County, Utah, was 769.

Employment and Income

The sectoral disturbance of employment opportunities for Sweetwater County is given in Table 3-2. In 1980, the largest employment sector was from mining (30 percent), followed by wholesale and retail trade with 18 percent, and construction and government with 13 percent of the total county employment. Services accounted for 12 percent of the employment opportunities. By 1984, it is expected that manufacturing employment would increase by 16 percent (although the actual number of jobs would be comparatively small), while construction would have 1,037 fewer employment opportunities. Both government and services sectors are also projected to expand. Between 1980 and 1990, the largest number of new jobs would occur in the government sector, followed by wholesale and retail trade and service; the construction sector would lose a total of 1,068 jobs during that decade.

In 1980, services and wholesale and retail trade sectors in Uintah County, Utah, accounted for 46 percent of the employment (28 and 18 percent, respectively), reflecting Uintah County's role as a service and trade center. Mining accounted for 19 percent of the employment, while government contributed 14 percent.

Uintah County baseline employment projections are identified in Table 3-2. In 1984, 21 percent of total employment would be wholesale and retail trade, with approximately 20 percent in both services and government. Mining would decline to 15 percent of employment. By 1990, wholesale and retail trade would drop slightly to 19 percent for all employment, with mining, services, and government each accounting for approximately 14 percent of the employment. These projections indicate that

TABLE 3-1
1984 AND 1990 POPULATION PROJECTIONS
(UINTAH AND SWEETWATER COUNTIES)

Area	1984 Population	Percentage Increase 1980-1984	1990 Population	Percentage Increase 1980-1990
Uintah County	27,074	32	29,326	42
Vernal	10,148	54	11,065	68
Balance of County	16,926	22	18,261	31
Sweetwater County	42,765	2	48,525	16
Rock Springs	19,941	2	22,614	16
Green River	13,128	3	14,902	16
Balance of County	9,696	3	11,009	16

Sources: Chevron 1982b
Utah Office of the State Planning Coordinator, ***Utah: 2000 A High Development Scenario*** March 1980.

TABLE 3-2
CURRENT AND PROJECTED EMPLOYMENT (UINTAH AND SWEETWATER COUNTIES)

Category	1980 Employment		1984 Employment		Percent Change 1980-1984		1990 Employment		Percent Change 1980-1990	
	Uintah	Sweetwater	Uintah	Sweetwater	Uintah	Sweetwater	Uintah	Sweetwater	Uintah	Sweetwater
Agriculture	611	235	681	234	11	0	629	234	8	0
Mining	1,660	7,142	1,446	7,834	−13	10	1,393	8,175	−4	14
Construction	295	3,173	408	2,136	38	−33	506	2,105	24	−34
Manufacturing	190	479	326	554	72	16	363	712	11	49
Transportation and Public Utilities	624	1,963	628	1,933	1	−2	631	2,088	*	6
Wholesale and Retail Trade	1,585	4,431	2,071	4,703	31	6	2,252	5,383	9	21
Finance, Insurance, and Real Estate	181	468	235	476	30	2	253	526	8	12
Services	2,480	2,903	1,971	3,193	−21	10	1,916	3,556	3	22
Government	1,259	3,067	1,936	3,378	54	10	1,968	4,079	2	33
Miscellaneous	28	40	31	41	11	3	30	45	0.3	13
TOTAL	8,913	23,901	9,733	24,482			9,941	26,903		

Sources: Vernal City-Uintah County Planning Office 1981; Ashley Valley Master Plan, Vernal, Utah; U.S. Dept. of Commerce, Bureau of Economic Analysis, Regional Economic Information System, 1982; Chevron 1982a.

Note:. The employment projections were derived by multiplying the 1985 and 1990 employment figures for Uintah Basin in the Ashley Valley Master Plan by 0.65. The 1984 figures were then interpolated to 1985. The multiplier (0.65) was suggested by Mr. Robert Hugie, Assistant Planner, Vernal City - Uintah County Planning Office.

*Less than 1 percent.

Uintah County would continue to be a trade and service center.

Between 1975 and 1980, Sweetwater County showed an increase in total personal and per capita income (in current dollars). Total income increased 128 percent from 1975 to 1980, while per capita income increased by 69 percent. These increases reflect the expansion of employment in the high-paying sectors of construction and mining.

Projections of baseline total and per capita incomes for Sweetwater County are displayed in Table 3-3. It is projected that between 1984 and 1990, total personal income would increase by about 9 percent, while per capita income would decline by a little over 4 percent (1982 dollars). The decline in per capita income and decline in the rate of growth in total personal income stem from the rise in employment in the government, service, and wholesale and retail trade sectors of the economy during the 1980's. Wages in these sectors are generally less than those in the mining and construction sectors.

Facilities/Services

Current and projected baseline needs for services and facilities for Sweetwater County are given in Table 3-4. The largest personnel needs would occur in the county sheriff's office and the health care field, with a steady increase in the demand for sworn officers and all personnel involved in health care. Sweetwater County administration facilities are not presently adequate and would need to be expanded, and new facilities are being planned. Additional personnel requirements are minimal.

TABLE 3-3
1984 AND 1990 PROJECTED INCOME
(SWEETWATER COUNTY)

Category	1984	1990
Total Personal Income*	$588,566	$639,642
Per Capita Personal Income	13,763	13,182

Source: Chevron 1982b
*Reported in thousands of 1982 dollars.

TABLE 3-4
CURRENT AND PROJECTED PERSONNEL AND FACILITIES
(SWEETWATER COUNTY)

Personnel/Facilities	Current	1984	1990
County Administration*			
Full-time	27	27	30
Part-time	6	6	6
County Sheriff			
Sworn officers	24	32	36
Support Personnel	15	13	14
Health Care			
Physicians**			
Dentists	17	21	24
Nurses (RN)	172	191	217
Nurses (LPN)	43	65	74
Library			
Full-time	30	29	32
Part-time	10	7	8
County Sheriff			
Number of vehicles	19	19	21
Health Care			
Number of hospital beds	100	88	99
Number of nursing home beds	101	104	118
Number of ambulances	10	12	14

Source: Chevron 1982b.
Note: Projected personnel needs are based on standards used in the Industrial Siting Countil permit application. Current personnel levels are as of the date of data collection.
*Includes the county personnel, treasurer, and assessor's office.
**Primary care physicians only.

In order for Rock Springs to meet baseline personnel needs in 1984 and 1990, few additional personnel would be required (Table 3-5). Facilities in Rock Springs are either adequate or nearly so, up to 1990, except for sewage treatment (Table 3-5). By 1990, Rock Springs would have to increase its sewage treatment capacity by 19 percent, since the present system is now operating above capacity. However, the city is currently constructing a 2.25 million gallon per day expansion, which would make the system adequate through 1990. The solid waste disposal facility for Rock Springs would more than adequately serve the needs of the baseline population through 1990 (Chevron 1982b).

Baseline personnel and services needs for Green River are also given in Table 3-5. By 1990, more personnel would be needed in the public works office (full-time staff), police department (support personnel), and fire department. Other personnel needs would be minimal. The sewage treatment facility presently operates above its designed capacity and does not meet federal water purity standards. Green River is upgrading and expanding the system to a capacity of 1.5 million gallons per day with capabilities of increasing the capacity to meet future needs through 1990. In order for the fire department to adequately meet the needs of the community in 1985, an additional fire station and truck would be needed. The solid waste disposal facility is considered adequate to meet baseline needs through 1990 (Chevron 1982b).

Virtually all of the human services agencies in Sweetwater County are located in Rock Springs and operated on a county-wide basis. Most of the services discussed here are funded by one or more county, state, or federal agencies. As indicated in Table 3-6, most agencies would need few additional personnel in order to adequately meet the needs of the population in 1990. The exception is day-care, where 18 percent more day-care openings for children would be needed. The facility needs of other agencies are quite varied and not easily summarized, but none appear inadequate to meet baseline projections. The information on needed facilities is given in the Chevron Phosphate Project Industrial Siting Council Permit Application (Chevron 1982b).

Education

The baseline projections for enrollment, classroom, and staff needs for School Districts 1 and 2 are given in Table 3-7. School District 1, which includes Rock Springs, has kept up with demand through an extensive building program. In 1981, a successful school bond issue gave the school district the ability to raise over $15 million during the next 5 years, which should make it capable of meeting baseline increases (Chevron 1982b). There would be a 14 percent increase in total enrollment (16 percent in grades kindergarten (K) through 6 and 11 percent in grades 7 through 12 in 1984). An additional 39 classrooms are needed for grades K through 6 by 1990, while classrooms would be adequate for grades 7 trhough 12 through that year. The number of teachers needed would increase by 20 percent for grades K through 6 and 9 percent for grades 7 through 12.

School District 2, which serves Green River, is in good condition and currently has excess classroom capacity at all grade levels. The district recently added one new elementary school and expanded the Green River High School as well as Monroe Elementary School.

The staffs of the two private schools, Sweetwater County Catholic School and Sweetwater County Christian School, are nearly sufficient to meet personnel needs in 1990. The facilities of the two schools are adequate through the end of the decade (Table 3-8). At Western Wyoming College, enrollments are projected to increase enough by 1990 to increase the number of needed teachers by 13 percent. The physical facilities would be adequate through 1990. Daggett County, Utah, has three schools; Manela Elementary School, Dutch John Elementary School, and Manela Senior High School. Their current enrollment/capacity is 82/100, 50/150, and 86/200 respectively.

Housing

The housing supply in Sweetwater County and its jurisdictions is displayed in Table 3-9. Nearly 50

TABLE 3-5
CURRENT AND PROJECTED PERSONNEL AND FACILITIES
(ROCK SPRINGS AND GREEN RIVER)

Personnel/Facilities	Current	1984	1990
Rock Springs			
City Administration			
Full-time	30	30	34
Part-time	1	1	1
Police Department			
Sworn Officers	42	40	45
Support Personnel	21	16	18
Fire Protection			
Full-time	30	30	34
Volunteers	2	2	2
Sewage Treatment			
Capacity (mgd)*	2.75	2.89	3.28
Water Treatment and Distribution			
Capacity (mgd)*	12.0	12.0	12.0
Police Department			
Number of vehicles	42	40	45
Green River			
Police Department			
Sworn Officers	29	26	30
Reserve Officers	12	11	11
Support Personnel	4	10	12
Fire Protection			
Firefighters**	49	51	58
Sewage Treatment			
Capacity (mgd)*	1.24	1.58	1.79

Source: Chevron 1982b.

Note: Projected personnel needs are based on standards used in the Industrial Siting Council permit application. Current personnel levels are as of the date of data collection.

*mgd = millions of gallons per day.

**Includes a full-time fire chief, assistant chief, and two captains.

TABLE 3-6
CURRENT AND PROJECTED HUMAN SERVICES PERSONNEL (SWEETWATER COUNTY)

Personnel	Current	1984	1990
Public Assistance and Social Service			
Social Workers	7	7.5	8.5
Public Assistance and Clerical	9	9	10.5
Job Service			
Personnel	15	15	17
Southwest Counseling Service			
Professional Staff	7	7	8
Clerical Staff	5	5	6
Task Force on Sexual Assault			
Staff	4.5	4.5	5.0
Volunteers	27	28	32
Young Women's Christian Association			
Full-time Staff	22	23	26
Part-time Staff	6	6	7
Southwest Wyoming Alcoholism Rehabilitation Association Staff	2	2	2
Sweetwater County Child Development Center			
Staff	20	21	24
Family Planning			
Staff	3	3	3
Western Wyoming Women's Resource Center			
Staff	1.5	1.5	1.5
Volunteer Information and Referral Center			
Staff	1.5	1.5	1.5
Day-care Services			
Day-care Openings	615	641	728

Source: Chevron 1982b.
Note: Projected personnel needs are based on standards used in the Industrial Siting Council permit application. Current personnel levels are as of the date of data collection.

TABLE 3-7
CURRENT AND PROJECTED ENROLLMENT, CLASSROOMS, AND STAFF (SCHOOL DISTRICTS 1 AND 2)

Category	School District 1 Current	School District 1 1984	School District 1 1990	School District 2 Current	School District 2 1984	School District 2 1990
Enrollment						
K-6	3,349	3,415	3,885	2,147	2,153	2,413
7-12	2,232	2,183	2,484	1,373	1,356	1,542
Total	5,581	5,598	6,369	3,520	3,529	3,955
Classrooms						
K-6	155	171	194	162	108	121
7-12	134	109	124	75	69	77
Total	289	280	318	237	177	198
Staff						
Teachers (K-6)	162	171	194	101	108	121
Teachers (7-12)	134	128	146	84	80	91
Special Education*	39	42	48	28	28	31
Professional Support**	42	42	48	28	28	31
Administration***	66	66	75	29	29	32

Source: Chevron 1982b.

Note: Projections of enrollment, classrooms, and staff are based on standards used in the Industrial Siting Council permit application. Current levels are as of the date of data collection.

*Special education areas include: remedial, speech, gifted and talented, mentally handicapped, trainable mentally handicapped, physically handicapped, emotionally disturbed, culturally different, learning disabled, and others.

**Professional support includes: clerical, pupil services, guidance counselors, social workers, nurses, psychology personnel, staff services, staff training personnel, librarians, and media.

***Administration includes: superintendents, secretaries, assistants of instructional support, principals, assistant principals, directors, coordinators/supervisors, clerks, assistant superintendent of business affairs, business managers, and personnel directors.

percent of all county housing units are located in Rock Springs, another 28 percent in Green River, and the remainder in the rural county area. In the two cities, a majority of the units are single-family dwellings, while mobile homes make up nearly 55 percent of the rural housing units. Thirty-three percent of the total units are classified as rentals, with a median rent of $251 (14 percent above the state average).

Pacific Power and Light Company determined the county-wide vacancy rate in June 1980 to be 3.6 percent. Local planners currently estimate it to be approximately 2 percent (Unger 1982).

Baseline projections for Sweetwater County show a need for approximately 330 more housing units by 1984 and another 1,600 units by 1990. Developers in both communities plan to construct multifamily units and mobile home parks as the demand warrants. The rapid growth and expansion of housing which occurred in the 1970's supports the prediction that developers could again meet real increases in demand as they occurred.

TABLE 3-8
CURRENT AND PROJECTED PERSONNEL FOR PRIVATE SCHOOLS AND WESTERN WYOMING COLLEGE, (SWEETWATER COUNTY)

	Current	1984*	1990*
Sweetwater County Catholic School	14	14	16
Sweetwater County Christian School	7	7	8
Western Wyoming College	72	71	81

Source:. Chevron 1982b.
Note: Projected personnel needs are based on standards used in the Industrial Siting Council permit application. Current personnel levels are as of the date of data collection.
*Number of teachers.

TABLE 3-9
PROJECTED HOUSING CHARACTERISTICS (SWEETWATER COUNTY)

County/Community	Total Housing Units	Single Family Units	Mobile Home Units	Multi-Family Units
1984 Sweetwater County	15,388	8,266	2,981	4,141
Rock Springs	7,658	3,960	2,176	1,522
Green River	4,336	2,952	593	791
Balance of County	3,394	1,354	212	1,828
1990 Sweetwater County	17,261	9,212	3,395	4,654
Rock Springs	8,525	4,350	2,473	1,702
Green River	4,914	3,337	684	893
Balance of County	3,822	1,525	238	2,059

Sources: Chevron 1982b.
Wyoming Department of Administration and Fiscal Control, Census Retrieval and Information Service, Report No. 5, October 1981.

Fiscal

The baseline projections of revenues and expenditures for Sweetwater County, the cities of Green River and Rock Springs, and School Districts 1 and 2 in Sweetwater County are displayed in Table 3-10 and indicate a financially healthy budget between 1981 and 1990. Assessed value is projected to more than triple, and property tax yield would increase from $12.76 million to $30.2 million during this period.

Due to an ambitious building program in Rock Springs, sizeable capital outlays are projected under the baseline forecast, causing projected

TABLE 3-10
BASELINE REVENUES AND EXPENDITURES FOR SWEETWATER COUNTY AND JURISDICTIONS

Jurisdiction	Category	1984	1990
Sweetwater County	Total Revenue	$22,938.3	$37,997.7
	Total Expenditures	16,783.5	17,721.9
	Revenue Surplus/Deficit	6,154.8	20,275.8
City of Rock Springs	Total Revenue	11,651.3	12,741.3
	Total Expenditures	17,259.7	13,788.7
	Revenue Surplus/Deficit	– 5,608.3	– 1,047.4
City of Green River	Total Revenue	9,169.9	10,751.8
	Total Expenditures	10,681.7	11,705.6
	Revenue Surplus/Deficit	– 1,511.8	– 953.8
Sweetwater County School District 1	Total Revenue	31,961.6	57,883.9
	Total Expenditures	23,528.2	26,331.2
	Revenue Surplus/Deficit	8,433.4	31,552.6
Sweetwater County School District 2	Total Revenue	18,618.7	33,291.6
	Total Expenditures	10,503.3	11,789.2
	Revenue Surplus/Deficit	8,115.4	21,502.3

Source: Chevron 1982b.
Note: Figures given in thousands of 1982 constant dollars.

revenue deficits. Alternative financing methods could eliminate these deficits. The city has no current outstanding general obligation debt and anticipates funding of capital outlays from current and projected revenues.

For the City of Green River, revenues are projected to be sufficient to cover expenditures for operations; however, revenue deficits may be caused by future capital improvements. As of 1982, the city had a legal debt margin of slightly over $1 million.

Based on the present state school financing system, Sweetwater County School Districts 1 and 2 would realize sizeable revenue surplus through 1990 (Table 3-10). However, the current school finance system was ruled unconstitutional in 1980 and, depending upon the resolution of the financing system problem, the two districts could lose in excess of $5 million and $4 million, respectively, based upon 1982 budgets (Meyer 1982). The legal debt margin in 1982 for Districts 1 and is $58.5 million and $5.6 million, respectively.

Social

As discussed, the study area experienced considerable economic and demographic change during the 1970's, which resulted in dramatic social changes. The rapid increase in population required substantial adaptation by area residents as they struggled to provide services and maintain their social organization. After turbulent times in the early 1970's, Sweetwater County, Rock Springs, and

Green River have stabilized. Due to the adaptations of both government and society to the earlier growth, Sweetwater County should be prepared to meet projected baseline conditions without difficulty and without large changes in social organization.

3.2.3 Transportation Networks

Transportation networks would be primarily affected by the plant complex and the Red Creek Canyon phosphate slurry pipeline in Utah.

Plant Complex

The transportation network affected by the plant complex includes Interstate 80, the major east-west route through Sweetwater County, between Green River and Rock Springs, the south belt route of Rock Springs, Wyoming State Highway 430 from southeast of Rock Springs to the plant site, and the northern 2.5 miles of County Road 4-27. Although traffic counts west of Green River indicate an increase in traffic, the present volume is not near capacity level. Wyoming State Highway 430, the south belt route, and County Road 4-27 are presently in good condition. Collector and arterial routes within the City of Rock Springs are presently in good condition. Recent completion of, and future plans for, by-pass routes and intra-city arterial routes would continue to ease traffic congestion throughout the baseline forecast years.

Traffic volume on the Union Pacific east-west rail line out of Rock Springs does not presently exceed its capacity. Rail lines in Rock Springs would be adequate to meet baseline forecasts.

Red Creek Canyon Phosphate Slurry Pipeline

The pump station for the phosphate slurry pipeline would be located on an existing county road. Within the State of Utah, the road network located in the area of influence consists of a variety of roads ranging from a principal two-lane arterial highway (U.S. Highway 40), to primitive dirt roads.

U.S. Highway 40 has heavy year-round traffic which increases during the summer tourist season. Annual truck traffic exceeds 20 percent of the traffic volume on this highway. U.S. Highway 191 is a very heavily traveled, narrow winding, paved road that is used by many tourists during the summer. However, this highway also has considerable local traffic year-round.

3.2.4 Air Quality

The existing air quality of the area affected by the proposed action components is well within Wyoming and Utah ambient air quality standards. The major air quality impacts would result from the operation of the plant complex in Wyoming. Therefore, this description focuses on the Wyoming portion of the affected area. The existing air quality in Utah is basically the same as that described for Wyoming.

Attainment Status

The area of site influence for the plant complex is designated attainment for all National Ambient Air Quality Standards (NAAQS) pollutants. The entire State of Wyoming is designated attainment for these pollutants with the exception of the trona industrial area which is classified as nonattainment for total suspended particulates (TSP). This area is approximately 20 miles west-northwest and generally upwind of the plant complex site.

PSD Classification

The area of site influence is designated as Class II under the federal and state Prevention of Significant Deterioration (PSD) regulations. The closest Class I area to the plant complex site is the Bridger National Wilderness Area which is located approximately 58 miles to the north. The

Savage Run National Wilderness Area is located approximately 150 miles east of the plant complex. No state or Indian redesignation of areas to Class I are pending in Wyoming, Colorado (Mohr 1981), or Utah (Cordner 1981). However, there are federally recommended Class I areas in the general project region (Elms 1981; Rochelle 1981; and Lukow 1981). These areas and their locations, with respect to the plant complex site, are:

- Popo Agie Primitive Area (approximately 60 miles north)
- Fossil Buttes National Monument (approximately 80 miles northwest)
- Dinosaur National Monument (approximately 60 miles south)
- Scab Creek Primitive Area (approximately 80 miles northwest)

Total Suspended Particulate Matter (TSP)

Because the climate in the project region is semi-arid, fugitive dust emissions from natural sources, such as wind erosion of exposed soil, and from non-industrial sources, such as vehicular traffic on unpaved roads, are the main sources contributing to background atmospheric concentrations of TSP. Table 3-11 shows required background pollutant data as the result of monitoring conducted by the State of Wyoming in Sweetwater County, Wyoming. As noted, the monitors located in populated areas (i.e., Rock Springs, Green River, and Granger) show TSP concentrations elevated above background levels obtained from rural areas (i.e., Eden and Patrick Draw). Monitoring results from the background rural monitors show levels in the range of 10 to 20 micrograms per cubic meter ($\mu g/m^3$), annual geometric mean, and because climate and vegetation are similar, the results are representative of background concentrations throughout the project region, including those portions of the project that would be constructed in Utah. Chevron's preconstruction monitoring station, located at the proposed plant site, monitored TSP for the first half of 1982 and showed results of 14 $\mu g/m^3$ annual geometric mean.

The elevated levels of TSP in populated areas in Sweetwater County are due to city traffic on both paved and unpaved roads, construction activity, wind erosion of disturbed soil, and some light industry. Primarily, Rock Springs has been affected by these population-oriented emissions; monitors in town have shown concentrations of TSP in excess of Wyoming standards. These effects are localized; as can be determined by comparing the results from Rock Springs' downtown and major thoroughfare areas with those obtained in Rock Springs' residential area.

Sulfur Dioxide (SO_2)

There is no source of SO_2 throughout the vast majority of Sweetwater County. SO_2 emissions come from fuel burning in the populated areas, from coal combustion in industrial boilers used in the trona industry, from coal combustion in the Jim Bridger power plant, and from scattered oil and gas processing plants in the county. Table 3-11 also contains the results of SO_2 monitoring conducted by the State of Wyoming in Sweetwater County. This data shows that values are well below the Wyoming state standards in Rock Springs and in the Patrick Draw oil and gas area. All major industrial sources of SO_2, among those mentioned above, are also required to operate SO_2 monitoring networks. Results of industrial monitoring in Sweetwater County all show localized elevated SO_2 levels with concentrations tapering off to near zero within a few miles downwind. Because of the absence of any major SO_2 sources in the project region, the background concentration of this pollutant can be assumed to be near zero throughout the area. Chevron's pre-construction monitoring site also sampled for SO_2, and came up with an indicated annual average of less than 2 $\mu g/m^3$ during the first half of 1982. No SO_2 emissions would be generated by project construction activities in Utah.

Nitrogen Oxides (NO_X)

Nitrogen oxide occurrence in the atmosphere is similar to that of SO_2, in that population centers and industrial facilities are the major sources of this pollutant. The vast majority of the county is free

TABLE 3-11
REGIONAL BACKGROUND POLLUTANT DATA - ANNUAL AVERAGES

Region	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Total Suspended Particulate[a,b]										
Rock Springs Downtown	119 (Fearn)	118	115	90	100	81	113	94	142	54 (Fearn/ Stucker)
Rock Springs Elk Street Thoroughfare	---	60 (Logan)	74	40	58	46	52	71 (Landeen)	105	74
Rock Springs Residential	---	54 (Larson)	39 (Alder)	44	38	48	45	39 (Stanton)	36	32 (Stanton/ Wierdsma)
Green River	---	62 (Clause)	65	46	37	38	---	---	---	40 (June)
Granger	---	43	54	27	39	32	29	44	44	54
Eden	---	---	---	16	19	15	15	---	---	---
Patrick Draw	---	---	---	---	22	18	16	---	---	---
Sulfur Dioxide										
Rock Springs Downtown	4	3	1	2	1	0	0	2	1	1
Patrick Draw	---	---	---	---	26	26	26		---	---
Nitrogen Dioxide										
Rock Springs Downtown	---	---	---	---	---	25	29	35	60	44
Patrick Draw	---	---	---	---	18	18	18			---
Ozone										
Patrick Draw	---	---	---	---	---	39	59	---	---	---

Source: Wyoming DEQ 1981.
Note: All values in micrograms per cubic meter ($\mu g/m^3$).
[a]All Wyoming State TSP data after 1979 are corrected to standard conditions (25°C and 760 mm Hg).
[b]TSP data represents annual geometric mean.

from any of these sources of NO_x. In Sweetwater County, NO_x is emitted by automobiles in the towns, trona company boilers, the power plant, and oil and gas processing facilities. In addition, natural gas pipeline compressor stations generate significant quantities of NO_x. Table 3-11 also contains results of Wyoming's NO_x monitoring, showing slightly elevated levels of NO_x in Rock Springs and Patrick Draw.

These elevated levels are most likely caused by automobile traffic, and, in the case of Patrick Draw, the proximity to an oil and gas processing area. The levels are still well within Wyoming standards, however. As with SO_2 sources, major sources of NO_x are required to monitor for the pollutant, and results show the same dispersion to near zero concentrations within a few miles downwind. Because of the lack of sources, the concentrations of NO_x can be assumed to be near zero throughout the project area. Pre-construction monitoring for background concentrations of this pollutant at Chevron's proposed plant site indicated an annual average of less than 3 $\mu g/m^3$ during the first half of 1982. No NO_x emissions will be generated by project construction activities in Utah.

Fluorides

The background concentration of fluorides is near zero throughout the Chevron project region. There are no identifiable major sources of fluoride in the area and the Chevron preconstruction monitoring samples were all below detectable limits. No fluoride emissions will be generated by project construction activities in Utah.

Visibility

Visual range at the Rock Springs airport during the daytime is generally greater than 25 miles, over 75 percent of the time. Annual overall visibility (including night-time values) indicates a range greater than 25 miles more than 50 percent of the observation period. Less than 10 percent of the annual observations indicate a visual range of less than 10 miles. The best visibility is afforded during the summer. During the rest of the year, visual ranges decrease to 10 to 25 miles. Visibility of less than 0.25 mile usually occurs during the fall, winter, and early spring. Median visual range is described as being about 80 miles (EPA 1979).

3.2.5 Wildlife

Components of the project would be constructed on or across several kinds of wildlife habitats. Big game winter ranges are areas that are used from December 15 through April 1 during *normal* winters. Within these *normal* winter ranges are areas that are crucial to the survival of certain big game animals during heavy snowfall winters. These areas provide some factors (e.g., food) that are essential to the survival of the species under consideration. Maps A4-8 A and B and Maps A4-9 A and B provide the locations of key habitat areas for pronghorn, elk, and mule deer.

Sage grouse are common inhabitants of some of the areas that would be affected by the project. Crucial areas for sage grouse (Maps A4-7 A and B) include a 2-mile radius around each strutting ground (lek) which is used for nesting and brood rearing. The normal strutting and nesting period is from March 1 through June 15. Disturbance during this period could affect the production of young and the survival of the existing population.

Raptor nesting areas are generally occupied during the March 1 through the July 1 nesting and fledging period. Disturbance within a 1-mile buffer zone around the nesting sites could affect the successful nesting and production of young.

Several federally listed threatened and endangered species may occur on or along various components of the proposed action, including the black-footed ferret, bald eagle, peregrine falcon, and whooping crane (Appendix 5). The black-footed ferret could be found along any portion of the route wherever the route encounters whitetail prairie dog colonies. The Endangered Species Act of 1973 (amended) requires field surveys to determine whether the route would cross any prairie dog colonies. If the route disturbed any colony, surveys for ferrets would be initiated.

The burrowing owl and scrub jay are both listed as rare by the Wyoming Game and Fish Department. Portions of the proposed action in southwestern Wyoming could encounter both of these birds in pinyon-juniper and sagebrush habitat.

Plant Complex

The plant complex (including the gypsum impoundment and cooling pond) is located on yearlong pronghorn and mule deer ranges, winter/yearlong deer range, and sage grouse and whiteail prairie dog general distribution range. See Map A4-8 for locations of prairie dog habitat.

The power transmission line would cross

- 7 miles winter/ yearlong deer range MP 0 7
- 2 miles winter/ yearlong elk range MP 0 - 2
- 4 miles winter/ yearlong pronghorn range MP 0 - 4
- 3 miles summer/ yearlong pronghorn range MP 4 - 7
- 2 miles sage grouse/ whitetail prairie dog general distribution range MP 0 - 2

The power substation servicing the plant complex and the Davis Bottom plant process water pipeline pump station would be located on summer/yearlong deer range, winter/yearlong pronghorn range, and sage grouse and whitetail prairie dog habitat.

Davis Bottom Plant Process Water Pipeline

The water pipeline would cross:

- 7 miles winter/ yearlong deer range MP 2.5 - 8.5 and MP 15 - 16
- 8 miles yearlong deer range MP 0 - 2.5 and MP 10 - 15.5
- 9 miles occasional winter elk range MP 1.5 - 6 and MP 11.5 - 16
- 9.9 miles yearlong pronghorn range MP 0 - 6 and MP 12.5 - 16.4
- 6.5 miles winter/ yearlong pronghorn range MP 6 - 12.5

The access road along the pipeline route to the pump station would cross:

- 1 mile winter/ yearlong deer range MP 15.4 - 16.4
- 4 miles yearlong deer range MP 11.4 - 15.4
- 4.5 miles winter/ yearlong elk range MP 11.5 - 16
- 2 miles yearlong pronghorn range MP 14.4 - 16.4
- 3 miles winter/ yearlong pronghorn range MP 6 - 9
- 3 miles sage grouse/ whitetail prairie dog general distribution range MP 10 - 13

The power transmission line for Davis Bottom plant process water supply pipeline would cross:

- 1 mile winter/ yearlong mule deer range MP 15.4 - 16.4
- 9 miles yearlong deer range MP 0 - 9
- 4 miles winter and yearlong elk range MP 12 - 16
- 6.5 miles winter/ yearlong pronghorn range MP 0 - 6.5
- 3.5 miles yearlong pronghorn range MP 12.9 - 16.4
- 6.5 miles sage grouse/ whitetail prairie dog general distribution range MP 0 - 6.5

The water intake structure would be located on the Green River within the Flaming Gorge NRA. Water would filter from the river through the permeable rockfill into a settling pond. Rainbow and brown trout reside in this portion of the reservoir. Kokanee salmon and brown trout migrate from the reservoir into the Green River in the fall, while rainbow and cutthroat trout migrate from the reservoir during the spring. Several species of nongame fish reside in the area planned for the intake structure. The pump station would be located on winter/yearlong mule deer range.

Red Creek Canyon Phosphate Slurry Pipeline

Habitat Types: The phosphate slurry pipeline route would traverse five different vegetative habitat types (see Chapter 3, Soils and Vegetation section, for a complete description of the various vegetative types). Some of the wildlife species and their preferred habitats that would be found along the proposed action route are noted in Table 3-12.

The proposed action route would cross 77.3 miles of deer range, 54.4 miles of elk range, and 54.3 miles of pronghorn range (Utah Division of Wildlife Resources 1982; Wyoming Game and Fish Department 1982). In addition, it would also cross about 19 miles of whitetail prairie dog range. General raptor range would be encountered over the entire route, with one 8-mile long concentration area found north of the booster pump station from MP B15 to B23 in Wyoming (see Table 3-13 for specific miles of wildlife ranges). None of the proposed action facilities would traverse any identified fawning or calving areas.

The proposed action route would cross the Green River at about the SW 1/4, section 31, T. 2 N., R. 25 E. (MP A33.5). Some riparian habitat and cold water stream bottom habitat would be crossed.

The Green River below Flaming Gorge Reservoir is listed as a Class I stream by the Utah Division of Wildlife Resources and the Fish and Wildlife Service. The reason this portion of the Green River has been assigned a Class I value is that the existing habitat is capable of maintaining outstanding populations of high-interest fish species as defined by the State of Utah and furnishes a unique recreational fishery.

The Green River, below Flaming Gorge Reservoir, is zoned into two areas for stocking of trout. One zone extends from the dam downstream to Red Creek and receives a much higher stocking rate of rainbow and cutthroat trout than the zone that extends from Red Creek to Swallow Canyon. Brown trout are not stocked in the river since they reproduce successfully in all sections of the river (they appear to spawn more successfully downstream from Red Creek than above it). The natural silt from Red Creek tends to be carried more in suspension and, therefore, causes very little problem to gravel spawning beds for brown trout except during years of extremely high flows from Red Creek (Bonebrake 1982). In *"normal"* flow years, silt appears to be washed away from the gravel spawning beds below Red Creek.

Terrestrial Wildlife: The pipeline, throughout the entire length of this route, could affect about 84 species of small mammals (rodents, shrews, rabbits, etc.) generally occurring in large numbers in all vegetative habitats (Utah Division of Wildlife Resources 1981; Wyoming Game and Fish Department 1977). The only small mammal species of environmental concern along this route would be the whitetail prairie dog, which could furnish food and burrow habitat for the endangered black-footed ferret. Even though the whitetail prairie dog is not federally listed, it is discussed in conjunction with the black-footed ferret because these two species are so closely interrelated.

Sagebrush habitat, occupied by sage grouse, would be traversed by the proposed action slurry pipeline for an estimated 60 miles (Table 3-13). The slurry pipeline would pass within 2 miles of at least 14 known sage grouse strutting grounds (Map A4-7). In addition, there are probably more grounds that have not been identified at the present time.

Booster Pump Station and Power Transmission Line

The power transmission line for the booster pump station would traverse:

- 7.5 miles crucial deer winter range — MP 0-7.5
- 7.5 miles winter/yearlong elk range — MP 0-7.5
- 2.5 miles crucial pronghorn winter range — MP 5-7.5
- 5 miles yearlong pronghorn range — MP 0-5

The substation would be located on crucial deer winter range and yearlong pronghorn range. The booster pump station would be located on crucial

TABLE 3-12
SELECTED TERRESTRIAL AND AQUATIC SPECIES AND PREFERRED HABITATS AFFECTED BY THE PROPOSED ACTION[a]

Species	Habitat Type[b]						
	Riparian	Sagebrush Grass	Pinyon-Juniper	Mountain Shrub	Greasewood	Saltbush/ Shadscale	Aquatic
Endangered or Threatened:							
Federal List							
Bald Eagle	X– Wide ranging raptor which may occur in lowland habitats during winter						
Black-footed Ferret		X			X	X	
Bonytail Chub							X
Colorado Squawfish							X
Humpback Chub							X
Peregrine Falcon	X	X	X	X			
State of Utah:							
Declining Population							
Razorback Sucker							X
Big Game							
Black Bear				X			
Elk				X			
Moose	X						
Mountain Lion							
Mule Deer			X	X			
Pronghorn		X			X	X	
Small Mammals							
Cottontail Rabbit	X	X	X	X	X	X	
Coyote	X	X	X	X	X	X	
Deer Mouse	X	X	X	X	X	X	
Least Chipmunk	X	X	X	X	X	X	
Whitetail Prairie Dog		X			X	X	
Birds							
Blue Grouse				X			
Brewer's Sparrow	X	X			X	X	
Ferruginous Hawk	X	X			X	X	
Golden Eagle	X	X	X	X	X	X	
Green-tailed Towhee	X	X	X	X			
Horned Lark	X	X	X		X	X	
Harrier	X	X			X	X	
Mourning Dove	X	X	X		X	X	
Prairie Falcon	X	X	X		X	X	
Sage Grouse	X	X					

[a]Preferred habitats by species based on: Utah Division of Wildlife Resources 1981; Wyoming Game and Fish Department 1977.
[b]Refer to Soils and Vegetation section, Chapter 3, for a description of the various vegetative types.

TABLE 3-13
*WILDLIFE RANGES AFFECTED BY THE RED CREEK CANYON PHOSPHATE SLURRY PIPELINE AND ALTERNATIVE**

Species and Range Type	Red Creek Milepost	Red Creek Total Miles	MAPCO Milepost	MAPCO Total Miles	Northwest Milepost	Northwest Total Miles	Willow Creek Milepost	Willow Creek Total Miles
Mule Deer								
Segment A								
Crucial Winter Range	27-50.5	23.5	27-50.5	23.5	23-42.3	19.3	27-50.5	23.5
Normal Winter Range	0-8	8	0-8	8	0-8	8	0-8	8
Segment B								
Crucial Winter Range	0-7	7	0-7	7	0-7	7	0-7	7
Normal Winter Range	7-11	4	7-11	4	7-11	4	7-11	4
	24-45.8	21.8	24-45.8	21.8	24-45.8	21.8	24-45.8	21.8
Summer Range	11-24	13	11-24	13	11-24	13	11-24	13
Elk								
Segment A								
Normal Winter Range	5-9	4	5-9	4	5-10	5	5-9	4
	20-31	11	20-31	11	19-42.3	23.3	20-31	11
	37-52.4	15.4	38-50.5	12.5			37-51	14
Segment B								
Normal Winter Range	0-24	24	0-24	24	0-24	24	0-24	24
Pronghorn								
Segment A								
Crucial Winter Range	45-52.4	7.4	41-50.5	9.5	32-42.3	10.3	41-51	10
Yearlong Range	36-39	3	36-38	2				
Segment B								
Crucial Winter Range	0-4	4	0-4	4	0-4	4	0-4	4
Normal Winter Range	23-45.8	22.8	23-45.8	22.8	23-45.8	22.8	23-45.8	22.8
Summer Range	4-23	19	4-23	19	4-23	19	4-23	19
Sage Grouse								
Segment A	3-47	44	3-45	42	3-35	32	3-45.5	42.5
Segment B	21-37	16	21-37	16	21-37	16	21-37	16
Whitetail Prairie Dog Range								
Segment B	9-12	3	9-12	3	9-12	3	9-12	3
	21-37	16	21-37	16	21-37	16	21-37	16

*Based on maps furnished by Utah Division of Wildlife Resources 1982; Wyoming Game and Fish Department 1982.

deer winter range, winter/yearlong elk range, and crucial pronghorn winter range. About 84 species of small and large mammals could be affected by the booster pump station and substation, and portions of the power transmission line. The entire length of the transmission line also cross raptor habitat.

Railroad Spur

The 1.5 percent grade railroad spur would cross about 8.7 miles of summer mule deer range and yearlong pronghorn range from MP 0 to 8.7. The spur also would cross about 8.7 miles of sage grouse and whitetail prairie dog general distribution range (MP 0 to 8.7). About 2 miles of a raptor concentration area would also be crossed from MP 1 to 3.

Microwave System

The Wilkin's Peak microwave site would be located on normal-use deer winter range. During severe winters, there is also some migration of elk through the general area.

The Tepee Mountain microwave site would be located in winter/yearlong elk range. Mule deer use this area as a crucial winter range. The area is also within a broad classification of yearlong pronghorn range.

The Grizzly Ridge site is located on winter/ yearlong elk and deer range. The microwave site on Blue Mountain would be located on winter/ yearlong deer range and year-round sage grouse habitat. Refer to individual discussions of the various proposed action components for details on other habitat that would be affected by construction of the other four microwave sites.

County Road Relocation

The relocation of County Road 4-27 would cross 1.6 miles of summer range for both deer and pronghorn.

3.2.6 Visual Resources

The areas in which the proposed action and alternatives would be located were evaluated for visual resources using the BLM Visual Resource Management (VRM) system (1978a) on all public lands except for those managed by the Forest Service. Lands managed by the Forest Service were evaluated using the Visual Management System (1974). Both systems provide standardized methods for identifying and classifying visual resource values. Refer to Appendix 6, Visual Resource Management Methodologies, for a further explanation of each system. The nature of the visual resources does not lend itself to a description by individual proposed action component.

The proposed action would occur within two physiographic provinces containing a characteristic set of landscape features including landform and vegetation (Fenneman 1931). These features are used as a basis to determine existing visual values and to determine how changes brought about by the proposed action would affect these visual values. The southern section of the proposed action would traverse an area categorized as the Middle Rocky Mountain physiographic province. This area is characterized by steep, rugged mountains, traversed by the Green River to the north and covered with sagebrush/grass types in the low lands and open areas, a mixture of mountain shrub/aspen/ conifer on the higher elevations, and pinyon-juniper on the remainder of the area. Natural features have been infrequently altered, but include highways, primitive roads, occasional residences, historical structures, and mineral development.

The northern portion of the proposed action would occur within the Wyoming Basin physiographic province, which is characterized by upland plains dissected by dendritic drainage patterns creating moderate to steep side slopes. The vegetation is generally a sagebrush/grass type with pinyon-juniper types scattered throughout. Cultural modifications are few, other than a few roads, ranching facilities, and occasional utility lines.

The established VRM classes and Visual Quality Objectives (VQO) relate to the physical characteristics of these physiographic provinces previously described. Four of the five VRM classes and one of five VQO's would be crossed by the proposed action. In general terms, VRM Class II areas and a VQO classification of Retention would generally be found along the Green River, portions of heavily traveled highways, and portions of the Flaming Gorge NRA. These areas generally correspond to the most visually sensitive portions of the project area. VRM Class III areas and a VQO classification of Partial Retention, are generally associated with areas in a middle or background view of the same areas and are also visually sensitive. VRM Class IV areas are most commonly located in the remaining areas which are generally unseen by the public or the landscape features are less diverse. Clay Basin is rated as VRM Class V because of extensive oil and gas development (BLM 1979a, 1980b, 1982a; FS 1982c).

Maps A4-10A and 10B display the generalized boundaries of the VRM classes and VQO's. Maps indicating locations of scenic quality (variety class), visual sensitivity, and viewing distances for any specific site can be found at the appropriate BLM and Forest Service offices. A summary of the number of miles per VRM class and VQO or, where appropriate, the number of acres which would be affected by the proposed action are summarized in Table 3-14.

3.2.7 Land Use Plans

The fertilizer plant, the Davis Bottom water pipeline, the railroad spur, and the county road relocation

TABLE 3-14
TOTAL MILES AND ACRES OF VISUAL RESOURCE VRM CLASSES AND VQO'S AFFECTED BY THE PROPOSED ACTION

Component	VRM Class and/or VQO[a]	Number of Miles	Acres Affected by VRM Class/VQO
Plant Complex			
	IV	--	1,500
Davis Bottom Plant Process Water Pipeline			
	R	2	9
	III	12	54
	IV	17	77
Red Creek Canyon Phosphate Slurry Pipeline			
	II	15	98
	III	15	95
	IV	63	395
	V	5	32
Railroad Spur			
	III	3	53
	IV	6	107
Microwave System			
	R	---	1
	III	---	1
	IV	---	2
County Road Relocation			
	IV	1.6	29

[a]Refer to Appendix 6, Visual Resource Management Methodologies, for definitions of terms.

would be located entirely within Sweetwater County. In addition, portions of the Red Creek Canyon phosphate slurry pipeline and the microwave system would be located in Sweetwater County which adopted a land use plan in 1977. The five sections encompassing the plant site were recently re-zoned from agricultural to heavy industrial use through approval of the Sweetwater County Commissioners. The water supply pipeline would traverse an area directly east of Flaming Gorge Reservoir which is designated as *"Special Open Land"* and then enter the NRA. The remainder of the components in Wyoming would pass through areas zoned for agriculture. The components of the proposed action are consistent with the various uses allowed under these zoning designations. Portions of the slurry pipeline and the microwave system would pass through portions of Daggett and Uintah counties, Utah, which are zoned for mining and agricultural use. These components are consistent with uses allowed under the zoning designations.

The City of Rock Springs, which would be affected by employees of the Chevron Phosphate Project, is zoned for a variety of residential, business, and industrial uses. Employee housing must be constructed in areas designated for that use. If the area is not designated for that use, a special variance must be received from the City Council. The City of Vernal is also zoned for various residential, business, and industrial uses.

The components of the proposed action would affect areas which are covered by BLM management framework plans (MFP's) in Utah and Wyoming. The only plans which have a restriction on the location of new pipelines are those for the BLM Vernal District which state that all new pipeline construction should occur in existing right-of-way corridors.

The Red Creek Watershed Management Plan (BLM 1981c) covers the Red Creek Watershed ACEC (Map 1-2). This plan established a management policy which states, *"Limit surface disturbing activities (road construction, pipelines, etc.) to existing disturbed areas in the watershed wherever possible." The plan also established the following objectives: "Reduce the annual sediment yield of Red Creek from an average 84,000 tons per year to 60,00 tons per year or less."*

3.2.8 Recreation Resources

The primary type of recreational opportunities occurring within the area of influence, basically between Vernal, Utah, and Rock Springs, Wyoming, is known as dispersed recreation. Dispersed recreation is defined as impromptu camping and day use activities (FS 1976). Since the majority of the land is federally administered, a variety of dispersed recreational opportunities are available, such as sightseeing, hunting, fishing, floating the Green River, off-road vehicle (ORV) use, backpacking, and camping at undeveloped sites.

Plant Complex

The plant complex area currently provides only limited hunting opportunity and associated recreation use. The surrounding area is used for dispersed recreational pursuits (ORV activity, hunting, and sightseeing) and may be affected by population growth associated with construction and operation of the phosphate project. An undetermined number of newcomers would also use the recreation facilities (campgrounds, boat ramps, trails) provided at the Flaming Gorge NRA and the BLM Aspen Mountain, Three Patches picnic area.

Davis Bottom Plant Process Water Pipeline

The Davis Bottom plant process water pipeline would affect less than 0.25 mile of the Flaming Gorge NRA. The Davis Bottom area is a popular landing point for rafters and canoe enthusiasts who float the Green River from entry points above the town of Green River, Wyoming. Deer, antelope, and waterfowl hunting opportunities also occur in this area during the fall season.

Red Creek Canyon Phosphate Slurry Pipeline

The *"Drive through the Ages"* is a self-guided automobile tour located along U.S. Highway 191, north of Vernal, Utah. There are several sites located at auto-pullouts along the highway that interpret the geological history of the area for the public. The proposed slurry pipeline would cross this highway at MP A1.5.

Congress authorized the study of the Green River for potential Wild and Scenic River status (Public Law 93-651; January 3, 1975). Initially, the Colorado segment of the Green River within the Dinosaur National Monument was to be studied. However, upon the request of the Governor of Utah, the Utah segment of the Green River from the Flaming Gorge Dam spillway to the Utah/ Colorado state line, was added. The draft study indicated that all 91 miles of the Green River, from the spillway to the south boundary of the Dinosaur National Monument, would be eligible for inclusion into the Wild and Scenic River System. The study further recommended that Segment A (Red Canyon), from the dam spillway to Indian Crossing, be classified as scenic; Segment B, from Indian Crossing to the Gates of Lodore (north boundary of the Dinosaur National Monument), be classified as recreational; and Segment C, from the Gates of Lodore to the southern boundary of the Dinosaur National Monument, be classified as wild (NPS 1979). The pipeline would enter the Green River Wild and Scenic River study corridor at MP A32.5, cross the river at MP A33.5, and exit the study corridor at MP A34.5.

The phospate slurry pipeline (MP A31 to A39) would be within the Green River Corridor ACEC which is administered by the BLM Vernal District Office for a multitude of resource values including recreation.

Recreation along the Green River primarily consists of fishing and float trips. Table 3-15 depicts the 1981 river floating use from Little Hole to Brown's Park.

The proposed pipeline (between MP A33.5 and A37) would follow the north bank of the Green River and would be adjacent to the MAPCO pipeline and existing county roads within the Brown's Park area. Brown's Park was an outlaw hide-away and rest stop in the 1800's. The John Jarvie Ranch historical site within Brown's Park has been developed as an interpretive historic property. The proposed slurry pipeline (MP A35) would be located approximately 0.5 mile from the John Jarvie Ranch historical site. Additionally, between MP A33.5 and A37, the proposed pipeline would by-pass several popularly used dispersed camping sites located adjacent to the Green River.

The proposed slurry pipeline (MP A40.5 through A52.4 and MP B0 through B9.5), the booster pump station, and a microwave tower would be within the Red Creek Watershed ACEC which is administered by the BLM Rock Springs and Vernal District Offices. Hunting for deer and elk during the fall season is substantial within the ACEC. Hiking and dispersed camping opportunities are also known to occur within the unit. There is an unmarked auto pull-off along U.S. Highway 191 that overlooks the ACEC. This auto pull-off provides excellent opportunities for geological interpretation of the ACEC (BLM 1980b).

3.2.9 Wilderness

No designated wilderness areas would be affected by any component of the proposed action. However, one Wilderness Study Area (WSA) may be affected.

The Red Creek Badlands unit (WY-040-406) located approximately 35 miles south of Rock Springs, Wyoming, and 5 miles north of the Utah-Wyoming state line (Map 1-2), has been identified by the BLM as a WSA (BLM 1981). The unit contains approximately 8,020 acres and is considered a highly scenic area, a critical watershed, a valuable wildlife area, and a popular deer and elk hunting area (BLM 1980b). The BLM Salt Wells Management Framework Plan (1982) recommended that the entire WSA be determined as unsuitable for preservation as wilderness and that the unit be returned to multiple use. However, until Congress decides on the status of the area, it has to be managed so as to not impair its wilderness characteristics (see nonimpairment criteria, Section 603(c) of the Federal Land Policy and Management Act, 1976) (BLM 1980a). A draft EIS concerning site-specific wilderness unit and district-wide alternatives for the BLM Rock Springs District is expected to be submitted for public review by January 1983. Subsequently, a final EIS and study report on the wilderness review program is scheduled for completion by December 1983. The Red Creek Canyon phosphate slurry pipeline, (MP B7 through B9) north of the proposed booster pump station, would parallel the northwest boundary of the WSA for approximately 3 miles.

TABLE 3-15
GREEN RIVER FLOATING USE FROM LITTLE HOLE TO BROWN'S PARK
(1981)

Month	Boats (Weekend Use)	Boats (Weekend Use)	Average Party Size	Total People	Average Hours	Total Hours
April/May	10	10	3.7	74	5	370
Opener (MP 30-31)	14	10	4.5	63	5	315
June	63	88	4.5	680	5	3,397
July	135		4.7	563	5	2,815
July		111	4.0	444	5	2,220
August	95		3.5	332	5	1,662
August		105	3.8	402	5	2,011
September	44		2.4	93	5	464
September		40	4.0	160	5	800
October/ November	8		2.0	16	5	80
October/ November		10	5.0	50	5	248
TOTAL	369	374	3.8	2,877	NA	14,382

Source: Earl Smith, BLM Vernal District Office, 1982.

3.2.10 Cultural Resources

The Chevron phosphate project area lies in Utah within the Uintah Basin of the Colorado Plateau as described by Stokes (1979) and in Wyoming within the Green River Basin (Chevron 1982a). An overview study of the project area was performed by reviewing previous archaeological and historical works. Summaries of the cultural resources in the Uintah Basin are found in ***Class I Overview Study of the Vernal District, BLM (Jones and MacKay 1980) and Archaeological Inventory in the Seep Ridge Cultural Study Tract, Uintah County, Northeastern Utah*** (Larralde and Chandler 1981). A summary of the cultural resources in the Green River Basin was prepared by Woodward-Clyde Consultants for the project application to the ***Wyoming Siting Commission*** (Chevron 1982a).

In the Uintah Basin, over 1,300 sites have been identified and recorded. The archaeological information obtained from these sites has been used to establish a sequence of culture periods: Paleo-Indian Complexes, Archaic Cultures, Uintah Fremont Culture, and Numic Speaking Cultures (Ute/Shoshonean) (Larralde and Chandler 1981; Forsyth 1980). In the Green River Basin, the sequence of culture periods ranges from Paleo-Indian to Archaic to Late Prehistoric. Both Fremont and Shoshonean cultures have been identified in the Late Prehistoric culture period (Chevron 1982a; Phillips 1982).

Few cultural resource sites of the Paleo-Indian period have been identified within the project area. However, significant sites with Paleo-Indian materials have been found within 20 to 50 miles of the proposed project in Wyoming (Frison 1978; Sharrock 1966; Day and Dibble 1963; Jennings 1978; Moss, et al. 1951) and within the Uintah Basin. The most common types of cultural resource sites are surface campsites with hearths and limited activity sites with varying concentrations of lithic materials. While many of these sites lack diagnostic material with which to assign the sites to a particular culture period, it is presumed that many of these sites are indicative of the Archaic culture period.

The historic period is defined as that known from written accounts and, for the project area, began with the William Henry Ashley Expeditions of the North American Fur Company in 1824 and Ashley's float down the Green River in 1825 (Morgan 1964). Brown's Hole was a rendezvous site for early mountain men because of its relationship to rich fur bearing regions. However, the beaver fur trade came to an end in the late 1830's.

In 1850 and 1856, Captain Stansbury and Lieutenant Bryan surveyed a central east-west route (Goetzmann 1959). This route became known as the Stansbury-Bryan route and followed Bitter Creek from Rock Springs, Wyoming, west to the Green River. During the late 1850's, the route was taken by several groups of Cherokee Indians and was also known as the Cherokee Trail. A southern route along Currant Creek to the Green River was identified by Walker (1980) and Gardner (1981) as the most prevalent trail used by the Cherokee. Thus, some identify the southern route as the Cherokee Trail, and the Stansbury-Bryan route as the Overland Trail.

During the 1860's, mail was carried by pony express over parts of the Cherokee and Overland Trails and then later followed by the railroad. The route follows Bitter Creek Valley near the northern terminus of the proposed railroad spur.

After the railroad was completed in 1869, settlers moved into the area and established cattle and sheep ranches. Brown's Hole became Brown's Park and a stronghold for outlaws. In 1880, John Jarvie moved into Brown's Park and opened a general store on the bank of the Green River (Tennent 1981).

Gilsonite, gypsum, and asphalt were mined in the Uintah Basin after 1886 (Bender 1980). Other mineral development within the area has taken place since 1900. The historic sites in the area include trails of the early pioneers, railroad and telegraph lines, and remnants of military, ranching, and mining activities

Plant Complex

There has been no previous survey of the proposed fertilizer plant area. However, an intensive field survey is being conducted by Woodward-Clyde Consultants (Chevron 1982b). One site, a hearth of undetermined age, has been identified in section 15 located within the fertilizer complex site.

Davis Bottom Plant Process Water Pipeline

The plant process water pipeline water intake structure and associated power transmission line have not been surveyed for cultural resources. Portions of the water pipeline route have been surveyed for other projects.

Western Wyoming College conducted a partial survey of the area west of the proposed fertilizer plant site that coincides with the proposed power transmission line in section 18, T. 18 N., R. 104 W., and sections 13, 14, 23, and 24, T. 18 N., R. 105 W. No sites were identified within the corridor; however, five lithic scatters, two campsites, and a rock shelter are within the remaining power transmission line corridor. These sites were identified by surveys for Mountain Fuel Supply

Company (Lindsay 1977), MAPCO (Collins, et al. 1980) and a survey by BLM (Decker 1982). In addition to those sites mentioned for the power transmission line, four lithic scatters and a campsite are within the proposed plant process water pipeline corridor (Decker 1982).

Red Creek Canyon Phosphate Slurry Pipeline

Portions of the Red Creek Canyon pipeline corridor have been surveyed for the MAPCO natural gas pipeline (Collins, et al. 1980). In addition, there have been Mountain Fuel Supply Company (Lindsay 1977), BLM (Decker 1982; Phillips 1982), and Forest Service surveys (Iacovetta and McFadden 1977; Watts 1977). Over 50 sites have been identified within the corridor. Most sites are lithic scatters and campsites of undetermined age that are either ineligible for the National Register of Historic Places or have not been evaluated. Significant sites within the corridor include the Cherokee Trail, a multicomponent campsite, Doc Parson's Cabin, and Doc Parson's smelter. These sites are either on or determined eligible for listing on the National Register of Historic Places. The John Jarvie Ranch historical site is located 1 mile south of the proposed centerline. Between MP B11.6 and B15.6, is an area of high site probability if the pipeline deviated significantly from the existing road (Decker 1982). The associated power transmission line corridor has not been surveyed for cultural resources; however, several sheepherder campsites, lithic scatters, and a material source site have been identified (Collins, et al. 1980; Lindsay 1977; Decker 1982).

Railroad Spur

The railroad spur has not been surveyed for cultural resources. In an overview study, Chevron (1982a) indicated that the railroad spur corridor would traverse a former town dump and a portion of the Overland Trail.

Microwave System

Of the eight proposed microwave sites, three would be located on mountain peaks at existing sites, one in a previously disturbed area, and four would be constructed at various project facility locations. Since the mountain peak sites have already been disturbed, the likelihood of finding any significant cultural resource sites would be small. The possibility of finding other cultural resource sites at the project facility locations has been identified under the appropriate component discussion. However, the survey requirements (Appendix 2) would also apply to the mountaintop microwave sites.

County Road Relocation

The county road relocation route has not been surveyed for cultural resources. Chevron indicated in an overview study (1982a) that the county road relocation corridor would traverse a campsite containing a hearth.

3.2.11 Soils and Vegetation

The project area would encompass large expanses of soils and vegetation which do not lend themselves to a description by component. Therefore, the following description pertains to all components of the proposed action.

Soils

Two major land resource areas (MLRA's) comprise the area of influence (SCS 1981). The southern and northern parts would be located in the Central Deseritic Basin Mountains and Plateau area (MLRA 34) which has an average annual precipitation of 6 to 12 inches and an average frost-free season of 80 to 125 days. The remaining central part would be located in the Uinta Mountain area (MLRA 47) which has an average annual precipitation of 12 to 20 inches and an average frost-free season of 60 to 110 days.

For portions of the project area (SCS 1979; Wells and Knox 1981; Chamberlain 1977; Chamberlain 1978; Nielson and Hutchings 1972; BLM 1978; FS 1978), detailed soil surveys are available; general soil surveys are available for the remaining area (BLM 1977a; Wilson, et al. 1975; SCS 1976). These soil surveys have been used to evaluate potential impacts and would be used by Chevron and authorizing agencies to determine applicable erosion control and revegetation measures

The project area includes a wide variety and complex combination of soils due to the variations in parent materials, topographic, climatic, and vegetative features. The following generalized groups of soils were combined for evaluating potential impacts and determining erosion control measures, reclamation, and revegetation potential in the region.

- Soils of the terraces and floodplains. This group of soils occurs in two precipitation zones; those with less than 9 inches of annual precipitation and those with 10 to 16 inches.
- Soils of the rolling uplands, high terraces, alluvial fans and plateaus. This group of soils occurs in two precipitation zones; those with less than 9 inches of annual precipitation and those with 10 to 16 inches.
- Shallow, steep sloping soils and rock outcrops. This soil group occurs in two precipitation zones; those with less than 9 inches of annual precipitation and those with 10 to 16 inches.
- Moderately dark-colored soils of the plateaus and sideslopes.
- Soils of the mountain and high plateaus with annual precipitation ranging from 12 to 20 inches.
- Soils of the mountain valleys and drainageways with annual precipitation ranging from 10 to 16 inches.
- Soils of the mountain floodplains.

A brief description of these groups is provided in Appendix 7, Reclamation and Erosion Control Analysis.

Revegetation would be difficult on many soils in the region. Intensive reclamation measures would be required, especially in areas with less than 9 inches of annual precipitation and on the steeper sloping areas (15 percent and more) with shallow soils. Unfavorable soil properties, including rock fragments, thin surface layers, moderate to strong alkalinity, and shallow depths, are very common in the region and would present problems for erosion control and revegetation. (Refer to Appendix 7 for a discussion of unfavorable soil properties.) The most favorable areas for revegetation are the floodplains and terrace soils and the less-sloping plateau soils in the higher precipitation areas. Construction activities, mainly those associated with excavating, would be difficult in areas of shallow soils underlain by hard bedrock (most commonly on crest slope and ridge positions) and areas of rock outcrops. The lack of unconsolidated soil material in these areas would require additional fill materials from outside sources to provide adequate bedding material for pipeline construction.

The location and extent of the larger areas of unfavorable soils and terrain most susceptible to impacts from project activities are identified by project component and alternative in Chapter 4, Tables 4-23, 4-27, and 4-31.

The key issue areas determined to be most strongly affected by construction and operation of the proposed action are:

- *Rye Grass Draw.* This area is located between MP A28 and A30 (Map A4-1) and consists of a concave, mountain drainageway with slopes ranging from 9 to 28 percent. Portions with steeper slopes (15 to 28 percent) are usually narrow and bordered by steep mountain sideslopes (30 to 60 percent slopes) with shallow, rocky soils underlain by hard bedrock. Soils within the concave drainageway and toe slopes of the steep bordering sideslopes are most commonly deep and loamy and contain more than 35 percent rock fragments. The areas with slopes greater than 15 percent would require a contour alignment to compensate for the maximum 15 percent grade requirement for the slurry pipeline.

- *Red Creek Canyon.* This area is located between MP A42 and A45 (Map A4-2). The pipeline alignment would be located within a narrow, mountain floodplain ranging from approximately 50 to 200 feet wide with slopes ranging from 3 to 9 percent. The floodplain is bordered by steep sideslopes (30 percent to nearly vertical) and canyon walls consisting of rock outcrops and very shallow rocky soils underlain by hard bedrock. Soils of the floodplain are deep, loamy soils containing 35 to 60 percent rock fragments ranging in size up to 3 feet in diameter. The floodplain deposit ranges from approximately 4 to 10 feet in thickness. The streambed is on hard bedrock and meanders from side to side within the canyon, controlled by rock outcrops along the canyon wall and floor. The floodplain deposit is subject to stream cutting and rockfall from the adjoining colluvial slopes.

- *Red Creek Basin Escarpment.* This area is located between MP B5 and B8 (Map A4-3) near the northern (upper) edge of the Red Creek Watershed ACEC boundary. The area contains (1) a resistant sandstone ledge about 8 to 12 feet thick near the upper edge; (2) very steep, sparsely vegetated sideslopes (30 to 65 percent) and badlands consisting mainly of interbedded sandstone and shale exposures with small inclusions of shallow, loamy, and clayey soils underlain with soft bedrock; and (3) strongly sloping to steep sideslopes (15 to 30 percent) vegetated with pinyon-juniper and a low density understory of grasses and forbs, with shallow to moderately deep and deep loamy soils forming from sandstone and shale.

  The area has a dendritic drainage pattern with several intermittent stream tributaries leading to Red Creek. The badlands and steep sideslope exposures of sedimentary rock have very small amounts of unconsolidated materials and are subject to geological or natural erosion. There are no active landslides in the immediate pipeline alignment area. There are wet spots near MP A7.0 to A7.1 that will require drainage in order to provide adequate soil stability.

Vegetation

Native vegetation of the project area is characteristic of the arid and semi-arid regions of the United States (Cronquist, et al. 1972). Vegetation follows a zonal pattern that is determined by precipitation zones found at elevational changes. The lower elevations in Utah (5,000 to 6,000 feet), with an annual precipitation of 7 to 12 inches, support greasewood, saltbush, and sagebrush-grass vegetation types. Juniper and pinyon-juniper types occur from 7,000 to 8,000 feet in elevation with annual precipitation generally above 12 inches. Pinyon-juniper types grade into the sagebrush type at lower elevations and into the forest type in draws on north exposures of the higher ridges or at the upper extremes where patches of the aspen and mountain shrub vegetation occupy moist areas (BLM 1977a).

Table 3-16 details the vegetation types found in the proposed action area and Tables 3-17 and 3-18 show vegetation types which would be crossed by the proposed pipeline and occupied by associated facilities.

Neither the proposed action nor the alternative routes would affect any known threatened or endangered plant species. However, ***Penstemon yampaensis*** is known to exist in the Utah portion of the project area and ***Lesquerella macrocarpa*** can be found north of the plant site in Wyoming. These species are currently under review for possible listing as threatened or endangered.

TABLE 3-16
VEGETATION TYPES AFFECTED BY THE PROPOSED ACTION

Vegetation Types and Subtypes	Percent of Ground Cover	General Location and Soils	Associated Species
Sagebrush/Grass	10-25	Valley bottoms, plateaus and benches. Soils vary from shallow and rocky on hillsides and ridges to deep and well-drained soils on valley bottoms.	Antelope bitterbrush, rabbitbrush, true mountain mahogany, western wheatgrass, bluebunch wheatgrass, Indian ricegrass, blue grasses, needlegrass, phloxes, asters, buckwheats, bluebells, legumes, and pussytoes.
Pinyon-Juniper	6-20	Moderately to steeply sloping uplands with shallow rocky soils.	Utah juniper, Rocky Mountain juniper, pinyon pine, big sagebrush, black sagebrush, mountain mahogany, snowberry, chokecherry, cheatgrass, wheatgrasses, ricegrass, bluegrasses, asters, phlox, lupines, stonecrop, and buckwheat.
Greasewood	15-20	Generally located along drainages with deep soils.	Black greasewood, big rabbitbrush, big sagebrush, salt grass, western wheatgrass, seepweed, and saltbush, spp. Indian ricegrass.
Wet Meadow/Riparian Vegetation	25-60	Wet meadow vegetation is restricted to bottomlands which remain wet throughout most of the year. Soils are generally heavy and fairly shallow with a hardpan beneath.	Sedges, rushes, western wheatgrass, needle-grasses, bluegrasses, big sagebrush, stonecrop, and iris.
		Riparian vegetation is located along the major streams and the Green River. Soils vary from shallow rocky to deep alluvial deposits.	Willow, birch, rabbitbrush, sedges, rushes, bluegrasses.
Saltbush	5-20	Moderate to steep sloping uplands less than 8 to 10 inches deep with high salt content and shale outcrops.	Shadscale, gardners, saltbush, winterfat, feed sage, eriogonum, phlox, pussytoes, needle-and-thread, grass, Indian ricegrass, alkali sacaton and squirreltail.
Mountain Shrub/Aspen	10-20	Moderate to steep slopes with shallow to moderately deep soils.	Bitterbrush, curlleaf mountain mahogany, big sagebrush, rabbitbrush, chokecherry, snowberry, oniongrass, needle-and-thread grass, western wheatgrass, milkweed, aster, and lupines.

Source: **Three Corners Grazing EIS**, 1979; **Big Sandy Salt Wells Oil and Gas EA**, 1982; **Diamond Mountain URA 2**, 1977.

3.2.12 Agriculture

Grazing (Rangeland)

Livestock grazing occurs on private, state, and federal lands according to capacities determined by the managing agency (BLM or Forest Service), except in the vicinity of Diamond Mountain (Utah) where solid parcels of land are privately owned. The Rock Springs allotment in Wyoming contains alternate sections of private and government land, but these are managed by the BLM.

Grazing capacities vary according to vegetation type and land form. The arid lowlands support saltbush, greasewood, and sagebrush vegetation averaging 15 to 20 acres per animal unit month

TABLE 3-17
VEGETATION TYPES AFFECTED BY PROPOSED ACTION SURFACE FACILITIES

Vegetation Type	Plant Complex	Plant Power Substation	Davis Bottom Process Water Pump Station	Red Creek Phosphate Slurry Pipeline Booster Pump Station	Red Creek Phosphate Slurry Pipeline Power Substation	Microwave Sites (4)
Sagerush/Grass	X	X		X	X	X[1]
Pinyon-Juniper						
Greasewood	X					
Riparian Vegetation	X		X			
Mountain Shrub/Aspen						X[2]

Source: Diamond Mountain URA, 1977; Brown's Park URA, 1977; Ashley Creek URA, 1979; Salt Wells Oil and Gas EA, 1981.
[1]Black Mountain microwave site
[2]Buckskin, Grizzly Ridge, and Wilkins Peak microwave sites.
Note: Cropland and saltbush vegetation would not be affected by construction of the proposed action surface facilities.

TABLE 3-18
MILES OF VEGETATION TYPES AFFECTED BY PROPOSED ACTION LINEAR FACILITIES

Vegetation Type	Plant Power Transmission Line	Water Pipeline Access Road And Power Transmission Line	Pipeline and Power Transmission Line	Railroad Spur	County Road Relocation	Total
Sagebrush/Grass	50.0	25.0	61.7	8.0	1.6	101.3
Pinyon-Juniper	2.0	4.0	26.0	–	–	32.0
Greasewood	–	2.1	13.0	.4	–	15.5
Riparian Vegetation	–	.3	3.0	.3	–	3.6
Saltbush	–	–	–	–	–	–
Mountain Shrub/Aspen	–	–	2.0	–	–	2.0
TOTAL	7.0	31.4	105.7	8.7	1.6	154.4

Source: Diamond Mountain URA, 1977; Brown's Park URA, 1977; Ashley Creek URA, 1979; Salt Wells Oil and Gas EA, 1981.
Note: Cropland would not be affected by construction of proposed action surface facilities.

(AUM). Middle elevations with sagebrush, pinyon-juniper, and some mountain brush areas average 10 to 15 acres per AUM. Higher elevations with greater precipitation support a greater percentage of grasses which results in a higher carrying capacity of 6 to 10 acres per AUM. Grazing allotments which would be affected by the proposed action and alternatives are listed in Table 3-19.

Farming (Cropland)

Neither the proposed action surface facilities nor rights-of-way would affect any cropland. No cropland occurs within the Rock Springs, Wyoming, area where increased population from project activities would cause land use conversion for homesites and related urban development.

TABLE 3-19
GRAZING ALLOTMENTS BY MILEPOST AFFECTED BY THE PROPOSED ACTION AND ALTERNATIVES

				Slurry Pipelines				Slurry Water Supply
Land Administration	Allotment	Livestock Class	Season of Use	Red Creek Canyon	MAPCO	Northwest	Willow Creek	Jensen Alternative*
				UTAH				
B	Sadlier	C-S	S-F-W					0-1.5
B	Powell	S	W					1.5-3.0
B	S.J. Hatch	S	W					3.0-4.5
B	Sunshine Bench	C	S-F-W	0-3	0-3	0-3	0-3	4.5-10.5
B	Brush Creek	C	S	3-6	3-6	3-6	3-6	10.5-15.0
P	Donkey Flat	C	S-Su-F	6-8	6-8	6-8	6-8	
P	Diamond Mountain	S-C	S-Su-F	8-17	8-17	8-17	8-17	
B	Diamond Rim	S	W	17-18	17-18		17-18	
B	Diamond Spring	S	S-Su-W-F	18-20	18-20		18-20	
B	Gadson	C	S-F	20-23	20-23		20-23	
B	Mail Draw	C	S-Su-F	23-25	23-25		23-25	
B	Crouse Reservoir	C	S-Su-F	25-28	25-28		25-28	
B	Rye Grass	0	0	28-33	28-33		28-33	
B	Watson	C	S	33-34	33-34		33-34	
B	Bridgeport	C	S	34-39	34-37		34-37	
B	Willow Creek	C	S-Su	39-41			37-40	
B	Clay Basin	C	S-Su-F	41-47	43-47		40-47	
B	Red Creek Flat	C	S		37-43			
B	Beaver Dam	S	S-Su			17-22		
F	Pot Creek	C	Su			22-25		
F	Davenport	C	Su			25-27		
B	Little Hole	C	S-Su-F			27-29		
B	Little Davenport	C	Su			29-30		
F	Davenport	C	Su			30-32		
F	Goslin Mountain	C	Su			32-42		

TABLE 3-19
GRAZING ALLOTMENTS BY MILEPOST AFFECTED BY THE PROPOSED ACTION AND ALTERNATIVES (concluded)

Land Administration	Allotment	Livestock Class	Season of Use	Slurry Pipelines Red Creek Canyon	MAPCO	Northwest	Willow Creek	Slurry Water Supply Jensen Alternative*
				WYOMING				
B	Red Creek	C	S-Su-F	47–59	47–59	42–47	47–59	
B	Salt Wells	C-H	S-Su-F	59–63	59–63	47–51	59–63	
B	Mellor Mountain	C-H-S	S-Su-F-W	63–70	63–70	51–58	63–70	
B	Rock Springs	C-S-H	Y	70–98	70–98	58–82	70–98	

*There would be no impacts to grazing allotments from implementation of any other component of the proposed acton or from other alternatives.

Land Administration
B = Bureau of Land Management
F = Forest Service
P = Private Land

Season of Use
S = Spring
Su = Summer
F = Fall
W = Winter

Class Livestock
C = Cattle
S = Sheep
H = Wild Horses

3.3 MIDDLE FIREHOLE PLANT PROCESS WATER PIPELINE ALTERNATIVE

The affected environment for the following resources would be the same for this alternative as described for the proposed action: water resources, socioeconomics, air quality, transportation networks, land use plans, and wilderness. The descriptions include the water pipeline, access road, and power transmission line components associated with this alternative. No cropland would be affected by implementation of this alternative.

3.3.1 Wildlife

The Middle Firehole alternative pipeline would cross:

• 13.5 miles	winter/yearlong deer range	MP 2 - 11 and MP 15.5 - 20
• 2 miles	yearlong deer range	MP 0 - 2
• 11 miles	winter/yearlong elk range	MP 2 - 6.5 and MP 13.5 - 20
• 13.6 miles	winter/yearlong pronghorn range	MP 6 - 20.4
• 6 miles	yearlong pronghorn range	MP 0 - 6
• 6 miles	sage grouse/whitetail prairie dog general distribution range	MP 8 - 14

The access road located along the alternative pipeline route would affect:

• 4.5 miles	winter/yearlong deer range	MP 5.5 - 20
• 4 miles	yearlong deer range	MP 0 - 2 and MP 11.5 - 13.5
• 8 miles	winter/yearlong elk range	MP 2 - 4 and MP 14 - 29
• 8 miles	winter/yearlong pronghorn range	MP 11 - 15.4 and MP 17 - 20.4
• 6 miles	sage grouse/whitetail prairie dog general distribution range	MP 8 - 14

The power transmission line for the pump station would affect:

• 5 miles	winter/yearlong deer range	MP 9 - 14
• 9 miles	yearlong deer range	MP 0 - 9
• 5 miles	winter/yearlong elk range	MP 9 - 14
• 14 miles	winter/yearlong pronghorn range	MP 0 - 14
• 6 miles	sage grouse/whitetail prairie dog general distribution range	MP 8 - 14

The power transmission line, for its entire length, would cross raptor habitat.

The pump station would be located on general small mammal habitat near the Green River.

3.3.2 Visual Resources

The alternative would cross the variety of topography and vegetation that is typical of the Wyoming Basin physiographic province. Cultural modifications include roads, utility lines, and occasional ranching structures. The rights-of-way would be located within a visual resource classification of VRM Class IV from the plant site and across Little Bitter Creek; from there it would remain in VRM Class III until crossing within 1 mile of the boundary of the Flaming Gorge NRA. At that point, it would traverse a short section of VRM Class II and then terminate within an area of VQO retention classification. See Table 3-20 for total miles and acres that would be affected by this alternative.

3.3.3 Recreation Resources

The Middle Firehole alternative would cross 0.7 mile of the Flaming Gorge NRA between MP 19.7 and 20.4. There are no recreation facilities located along the alternative route. Recreational opportunities are of the dispersed type. Power boating occasionally occurs near the alternative pump station site. Additionally, some hunting opportunities, primarily for upland game, occurs along the river bottom and along the remainder of the alternative route.

3.3.4 Cultural Resources

The alternative pipeline, water intake structure, and associated power transmission line areas have not been surveyed for cultural resources. Portions of the water pipeline area have been surveyed for other projects. Western Wyoming College conducted a 50 percent survey of the area west of the proposed fertilizer plant that coincides with the location of the alternative power transmission line in section 18, T. 18 N., R. 104 W, and sections 13, 14, 12 and 24, T. 18 N., R. 105 W. Western Wyoming College did not identify any sites within this portion of the corridor; however, 14 lithic scatters and campsites were identified by surveys for Mountain Fuel Supply Company (Lindsay 1977), MAPCO (Collins, et al.

TABLE 3-20
TOTAL MILES AND ACRES OF VISUAL RESOURCE VRM CLASSES AND VQO'S AFFECTED BY THE MIDDLE FIREHOLE PLANT PROCESS WATER PIPELINE ALTERNATIVE

Component	VRM Class and/or VQO[a]	Number of Miles	Acres Affected by VRM Class/VQO
Plant Process Water Pipeline With Road			
	R	2	11
	II	2	10
	III	13	69
	IV	11	58
Power Transmission Line			
	R	1	2
	II	1	2
	III	8	20
	IV	4	10

[a]Refer to Appendix 6, Visual Resource Management Methodologies, for definitions of terms.

1980), and a survey by BLM (Decker 1982) within the remaining corridor.

3.3.5 Soils and Vegetation

The soils are the same types as discussed for the proposed action; refer to Appendix 7 for a discussion of soil groupings and to Chapter 4, Table 4-27, for identification and extent of sensitive areas. This alternative would cross the following vegetative types:

- 22.7 miles of Sagebrush/Grass
- 5.4 miles of Pinyon-Juniper
- 14.0 miles of Greasewood
- 0.3 mile of Riparian vegetation

3.3.6 Agriculture

This alternative would only cross the Rock Springs/Salt Wells grazing allotment as identified in Table 3-19.

3.4 JENSEN SLURRY WATER SUPPLY ALTERNATIVE

The following resources are the same as described for the proposed action: water resources, socioeconomics, air quality, transportation networks, and land use plans. The description includes the three components associated with the alternative (water supply pipeline, access road, and power transmission line).

3.4.1 Wildlife

The Jensen slurry water supply pipeline would cross:

• 12.5 miles	winter/yearlong mule deer range	MP 0 - 12.5
• 1 mile	pheasant habitat (agricultural land)	MP 18 - 19

The associated power transmission line would cross:

• 0.5 mile	ring-neck pheasant habitat (agricultural land)	MP 18.5 - 19

The power transmission line, for its entire length, would cross raptor habitat.

The Green River, in the vicinity of Jensen, Utah, is a significant spawning and nursery area for the Colorado squawfish (U.S. Fish and Wildlife Service 1982a). In addition, the water intake structure could affect the humpback chub.

3.4.2 Visual Resources

The alternative pipeline would affect primarily landform and vegetation types that are less characteristic of the Middle Rocky Mountain physiographic province than the other portions because the right-of-way would be located on the periphery of the province. Slopes in this area tend to be more gentle and the vegetation includes cropland. Cultural modifications include rural homes with limited agricultural activities, physical infrastructure, and the phosphate mine. The right-of-way would affect 2 miles of VRM Class II area near the Green River; it would then traverse 17 miles in which 1 mile of VRM Class III would be crossed. The pipeline would cross approximately 2 miles of VRM Class II prior to entering the mine property which is identified as VRM Class IV. See Table 3-21 for total miles and acres that would be affected by this alternative.

3.4.3 Recreation Resources

The alternative pipeline would parallel U.S. Highway 191 between MP 1.5 and 3. As discussed for the proposed action, Section 3.2.8, this portion of the highway crosses unique geological formations. The *"Drive through the Ages"* self-guided automobile tour would parallel the pipeline right-of-way corridor. In addition, an unknown amount of unauthorized ORV use may occur on portions of the alternative right-of-way.

TABLE 3-21
TOTAL MILES AND ACRES OF VISUAL RESOURCE VRM CLASSES AFFECTED BY THE JENSEN SLURRY WATER SUPPLY ALTERNATIVE

Component	VRM Class[a]	Number of Miles	Acres Affected by VRM Class
Slurry Water Supply Pipeline with Power Transmission Line and Pump Station			
	II	2	12
	III	1	6
	IV	17	100

[a]Refer to Appendix 6, Visual Resource Management Methodologies, for definitions of terms.

3.4.4 Cultural Resources

The Jensen alternative right-of-way corridor has not been surveyed for cultural resources; however, a survey was conducted in the vicinity of the corridor (Larralde and Chandler 1981). Nine sites were identified within this corridor including a rock art site, rock shelter, open quarry, wattle and daub house site, open village site, and four lithic scatters.

3.4.5 Soils and Vegetation

General soil conditions would be the same as described for the proposed action, Section 3.2.11, contained in this chapter. Refer to Appendix 7 for a discussion of soil groupings and to Chapter 4, Table 4-27, for identification and extent of sensitive areas.

This alternative would cross 18.5 miles of native vegetation and 1.1 miles of cropland consisting of the following vegetation types:

- 5.9 miles of Sagebrush/Grass
- 4.6 miles of Pinyon-Juniper
- 0.3 miles of Riparian vegetation
- 6.8 miles of Saltbush
- 1.1 miles of Cropland

The pump station would be located on riparian vegetation.

3.4.6 Agriculture

The Jensen alternative would cross five grazing allotments (Table 3-19). Grazing capacity is low and the area is used primarily by sheep during the winter season, and by cattle in the spring, fall, and winter.

The Jensen pipeline would also cross 1.1 miles of irrigated cropland on the terrace of the Green River (MP 17.9 to 19). Primarily alfalfa hay, small grains (barley and oats), corn for silage, and meadow hay are grown in this area; the land is also used for pasture. The principal crop is alfalfa hay. Approximately 50 percent of the irrigated cropland in this area is identified as prime agricultural land (SCS 1970).

3.5 PHOSPHATE SLURRY PIPELINE ALTERNATIVES

The affected area for the following resources would be the same as described for the proposed action: socioeconomics, water resources, and air quality. All of the slurry pipeline alternatives would use the same booster pump station, power transmission line and substation, and microwave facilities as identified for the proposed action. The descriptions of these areas are not repeated; the reader should refer to the appropriate resource sections identified for the proposed action. The alternatives, from the booster pump station north to the plant complex, would be the same as identified for the proposed action. No wilderness study areas or cropland would be affected from implementation of any of these alternatives.

3.5.1 Transportation Networks

The MAPCO and Willow Creek alternatives would affect the county road which extends through Jesse Ewing Canyon. This road has no number designation because Daggett County does not number county roads. However, this gravel road is used primarily for local travel serving the ranchers and residents of vacation homes in the area. Some recreation travel (float boaters) occurs during the summer, and big game hunters use this area during the fall. These alternatives would also affect the existing MAPCO liquid hydrocarbon transportation pipeline in Rye Grass Draw and Jesse Ewing Canyon.

The Northwest alternative would affect the Little Hole access road which is a wide, winding, dirt road extending from Dutch John to a campground and boat launching/landing area on the Green River. Traffic volumes are moderate, occurring mostly during the summer months. For about 1 mile, near

Little Hole Campground, the alternative would affect the existing Northwest natural gas transportation pipeline.

3.5.2 Wildlife

The alternative phosphate slurry pipeline routes would affect the same general raptor habitat as described for the proposed action. Although each alternative would cross the Green River at a different location, the type of riparian and aquatic stream bottom habitat would be the same as described for the proposed action. The threatened or endangered species that would be potentially affected by implementation of the slurry pipeline alternatives are the same as identified for the proposed action.

The habitat types crossed by these alternatives would generally be the same as those described for the proposed action (see Section 3.2.11 for a description of the various types). Tables 3-12 and 3-13 indicate data on species occurrence, preferred habitats, and habitats that would be crossed by the alternatives.

MAPCO

The MAPCO alternative would cross five different vegetative habitat types. (Refer Section 3.2.11 for a complete description of the various vegetative types.) Some of the wildlife species and their preferred habitats found along the MAPCO route are identified in Table 3-12. The MAPCO route would cross a total of 77.3 miles of deer range, 51.5 miles of elk range, and 57.3 miles of pronghorn range (Utah Division of Wildlife Resources 1982; Wyoming Game and Fish Department 1982). Additionally, the pipeline would cross about 60 miles of general distribution sage grouse range and pass within 2 miles of at least 12 known strutting grounds (Map A4-7). Also 19 miles of general distribution whitetail prairie dog habitat would be crossed. (See Table 3-13 for an analysis, by milepost, of various wildlife habitats.)

Northwest

The Northwest pipeline route would cross five different vegetative habitat types. Some of the wildlife species and their preferred habitats found along the Northwest route are listed in Table 3-12. Table 3-13 lists the distribution of various wildlife ranges by milepost. The Northwest route would cross a total of 73.1 miles of deer range, 52.3 miles of elk range, and about 56.1 miles of pronghorn range (Utah Division of Wildlife Resources 1982; Wyoming Game and Fish Department 1982). In addition, the pipeline would cross about 60 miles of general sage grouse range and pass within 2 miles of seven known strutting grounds (Map A4-7). About 19 miles of general distribution whitetail prairie dog habitat would also be crossed.

Willow Creek

The Willow Creek pipeline route would cross five different vegetative habitat types. Some of the wildlife species occurring along the Willow Creek route and their preferred habitats are listed in Table 3-12. The Willow Creek route would cross a total of 77.3 miles of mule deer range, 53.0 miles of elk range, and about 55.8 miles of pronghorn range (Utah Division of Wildlife Resources 1982; Wyoming Game and Fish Department 1982). In addition, the pipeline would cross about 60 miles of general sage grouse range and pass within 2 miles of 12 known strutting grounds (Map A4-7). About 19 miles of general whitetail prairie dog habitat also would be crossed. (See Table 3-13 for a listing of wildlife ranges by milepost.)

3.5.3 Visual Resources

Visual resource classifications that differ from the proposed action route are identified by alternative. See Table 3-22 for total miles and acres of visual contrast that would be affected by each alternative.

MAPCO

The MAPCO right-of-way located within a

TABLE 3-22
TOTAL MILES AND ACRES OF VISUAL RESOURCE VRM CLASSES AND VQO'S AFFECTED BY THE PHOSPHATE SLURRY PIPELINE ALTERNATIVES

Component	VRM Class and/or VQO[a]	Number of Miles	Acres Affected by VRM Class/VQO
MAPCO Phosphate Slurry Pipeline			
	II	18	114
	III	13	82
	IV	59	370
	V	6	38
Northwest Phosphate Slurry Pipeline			
	II	8	51
	III	15	95
	IV	55	350
	R	7	45
	PR	1	6
	M	2	13
Willow Creek Phosphate Slurry Pipeline			
	II	18	114
	III	13	82
	IV	59	370
	V	6	38
Power Transmission Lines and Substation[b]			
	II	2	6
	III	2	5
	IV	3	8

[a]Refer to Appendix 6, Visual Resource Management Methodologies, for definitions of terms.
[b]The power transmission line and substation would be the same for each alternative. (Refer to Table 3-14, Proposed Action.)

transitional area between the Wyoming Basin and Middle Rocky Mountain Physiographic Provinces, would encounter VRM Class II areas near Band Box Butte (MP A36) and surrounding the booster pump station in Red Creek Basin. A VRM Class II area is found near the Green River; the Clay Basin is classified as VRM Class V, and the remainder of the area which would be traversed is VRM Class IV. Cultural modifications in this area include intensive oil and gas development in the Clay Basin as well as ranching, occasional rural residences, and evidence of existing underground pipelines.

Northwest

Classifications include VRM Class II and Retention areas along the Green River, in the Flaming Gorge NRA, and in the Red Creek Basin; all are located within the Wyoming Basin and Middle Rocky

Mountain Physiographic Provinces. Short stretches of VRM Class III and Partial Retention areas occur in segmented portions of the alternative right-of-way. The majority and remaining portion of the right-of-way would be in VRM Class IV and VQO Modification areas. Cultural modifications in this area consist of occasional aboveground utilities and roads, facilities associated with the Flaming Gorge NRA, and scattered ranching activities.

Willow Creek

Within this right-of-way area, which is typically characteristic of the Middle Rocky Mountain Province, no visible cultural modifications are evident. Visual resource classifications include VRM Class II areas at each end of the pipeline segment, along the Green River, and surrounding Band Box Butte; the remaining portion is located in a VRM Class III area.

3.5.4 Land Use Plans

The land use plans and restrictions described for the proposed action would apply to each of the phosphate slurry pipeline alternatives. The Northwest alternative would affect land use plans which are different from those identified for the proposed action.

The Northwest alternative would cross 2.5 miles of the Flaming Gorge NRA (Map 1-2). This area is managed by the Ashley National Forest under direction and guidance set forth in the Flaming Gorge National Recreation Area Management Plan. This plan was completed and implemented in 1977.

Management direction and management decision pertaining to the portion of the NRA that would be crossed by the Northwest alternative are:

- Undeveloped Areas Management Unit GR-3, page 261, part b, of the NRA Management Plan: direction to *"manage the unit, to maintain its scenic qualities, and provide for wildlife and undeveloped area uses."*
- Part c(2): management decision to *"permit no uses that significantly degrade or destroy the aesthetic backdrop values of the unit."*
- Part c(5): decision to *"permit no new road or trail construction in this unit, except where temporary roads might be required to remove insect infested timber."*

The Ashley National Forest Travel Plan closes the Little Hole access road during the winter months to protect the road surface and the wildlife in the area.

3.5.5 Recreation Resources

The recreation resources that would be affected by the MAPCO and Willow Creek phosphate slurry pipeline alternatives are the same as described for the proposed action (Table 3-15). Between the existing Chevron mine and the crossing of the Green River (MP 27), the Northwest alternative would affect primarily dispersed recreation. An unquantified amount of ORV use and upland game hunting occurs along the existing Northwest pipeline route which would be basically paralleled by the alternative pipeline route (FS 1982a).

The Northwest pipeline route would enter the Green River study corridor (MP A26), cross the river (MP A27), and exit the study corridor (MP A28). The Green River Wild and Scenic River study status and Green River ACEC (MP A26 to A27) are discussed in the recreation section for the proposed action.

After the alternative crosses the river, it would enter the Flaming Gorge NRA (approximately between MP A27 to A29.5) which is administered by the Forest Service, Ashley National Forest. The approximate 2.5-mile portion of the NRA that would be crossed by the alternative has been identified and classified in the Flaming Gorge NRA Management Plan for its unique wildlife (deer, elk, antelope, mountain lion) and visual resource values (including recreational pursuits such as hunting, camping, hiking, sightseeing, float boating and fishing on the Green River). Refer to Land Use Plans section for more details.

At the river crossing and within the NRA, commonly known as Little Hole, fishing opportunities for rainbow trout are plentiful. The Forest Service also maintains a popular day use launching/landing area for float boaters. Additionally, the Forest Service plans to develop the Little Hole day use area into a 60-unit campground and pave the existing gravel boat ramp.

The alternative would also parallel the Little Hole access road and bore under it between MP A27.2 and A28.5. This access road provides main access into the Little Hole day use area. The average traffic flow along this road is 300 vehicles per day during weekdays, and 900 vehicles per day on weekends (Hobson 1982).

The pipeline route would by-pass the Forest Service-maintained Dripping Springs campground by approximately 1/8 mile (MP A29). The 40-unit campground located within the NRA, has a current capacity for 200 people. The campground is usually filled to capacity during the summer tourist season and fall hunting season, approximately from May through October.

In addition, the pipeline route would be visible from the Red Canyon Visitor Center. From the center and surrounding vista points, visitors currently receive spectacular views of the gorge area and adjacent landscape including the Goslin Mountain area where the alternative would cross.

From approximately MP A19.8 to A25.0 and from MP A29.5 to A31.5, the alternative would cross the Ashley National Forest outside the NRA. The area is used primarily for dispersed recreation such as hunting, camping, and ORV use along designated routes (FS 1982b). North of the national forest to the proposed fertilizer plant, dispersed recreation opportunities primarily consist of ORV use and some upland game hunting for sage grouse, chukar, rabbits, and other small game animals.

The Northwest alternative would cross a portion of the Goslin Mountain roadless area, which was evaluated by the Forest Service during the second Roadless Area Review and Evaluation (RARE II) for inclusion in the National Wilderness Preservation System. Although this area was recommended for non-wilderness designation, a recent court ruling in the Ninth Judicial District has ruled the RARE II process inadequate. This raises the possibility that the Goslin Mountain roadless area would require reevaluation for possible wilderness designation on a more site-specific basis.

3.5.6 Wilderness

The Northwest alternative would cross a portion of the Goslin Mountain roadless area, which was evaluated by the Forest Service during the second Roadless Area Review and Evaluation (RARE II) for inclusion in the National Wilderness Preservation system. Although this area was recommended for non-wilderness designation, a recent court ruling in the Ninth Judicial District has ruled the RARE II process inadequate. This raises the possibility that the Goslin Mountain roadless area would require reevaluation for possible wilderness designation on a more site-specific basis.

3.5.7 Cultural Resources

Portions of the areas that would be encompassed by the MAPCO, Northwest, and Willow Creek alternative routes have been surveyed for other projects (Collins, et al. 1980; Lindsay 1977; Decker 1982; Phillips 1982; Iacovetta and McFadden 1977; Watts 1977). Over 50 sites have been identified within each of the corridors. Most of these sites are lithic scatters and campsites.

A significant site which occurs in all the corridors is the Cherokee Trail, which is listed in the National Register of Historic Places. Doc Parson's Cabin, which is also listed on the Register would be affected by the MAPCO and Willow Creek alternative corridors. The only additional significant site, which would only be affected by the MAPCO alternative corridor, is Doc Parson's smelter.

3.5.8 Soils and Vegetation

General soils and vegetation conditions would be similar to those described in the proposed action section of this chapter. Refer to Appendix 7 for a discussion of soil groupings and to Chapter 4, Table 4-31, for identification and extent of sensitive areas. Only those areas of major concern that are different from the proposed action are identified for each pipeline alternative. These alternatives would cross the vegetation types identified in Table 3-23.

MAPCO

The MAPCO phosphate slurry pipeline would cross through three key issue areas: Rye Grass Draw, Jesse Ewing Canyon, and the Red Creek Basin Escarpment. (Refer to the proposed action section for description of the Rye Grass Draw and Red Creek Basin Escarpment.)

The Jesse Ewing Canyon area is located from MP A38 and A41 (Map A4-4). The alternative would extend through a narrow canyon containing a narrow floodplain (approximately 100 to 250 feet wide) with slopes ranging from 9 to 28 percent and bordered by very steep mountain sideslopes (30 to 65 percent). Soils within the floodplains are deep and loamy, containing 35 to 60 percent rock fragments varying in size from 3 inches to 2 feet in diameter. The steep canyon sideslopes consist of rock outcrops and shallow, rocky, sandy loam soils underlain by hard bedrock. There are springs located on the east-facing mountain sideslope near the central part of the canyon. The area currently contains a county road and the MAPCO pipeline.

Northwest

The Northwest alternative would cross the *Goslin Mountain and Red Creek Basin Escarpment* key issue areas. (Refer to the proposed action section for discriptions of the Red Creek Basin Escarpment area.) The *Goslin Mountain* area is located between MP A27.1 and A32.7 (Map A4-5). The pipeline would cross four main types of terrain and soils: (1) Steep and strongly sloping mountain sideslopes (15 to 40 percent) with shallow to moderately deep, and sandy loam and loamy soils containing 35 to 70 percent rock fragments underlain by hard bedrock

3-23
MILES OF VEGETATION TYPES AFFECTED BY THE PHOSPHATE SLURRY PIPELINE ALTERNATIVES

Vegetation Type	MAPCO	Northwest	Willow Creek
Sagebrush/Grass	63.7	57.1	62.3
Pinyon-Juniper	22.1	23.6	24.0
Greasewood	14.4	10.0	14.4
Riparian Vegetation	1.6	2.4	1.6
Saltbush	--	--	--
Mountain Shrub/Aspen	2.0	2.5	2.0
TOTAL	103.8	95.6	104.3

Source: Diamond Mountain URA, 1977; Brown's Park URA, 1977; Ashley Creek URA, 1979; Salt Wells Oil and Gas EA, 1981.
Note: Mileage figures include the pipeline and power transmission lines. No cropland would be affected by implementation of any of these alternatives.

with inclusions of rock outcrop; (2) abrupt, steep and very steep mountain sideslopes (40 to 65 percent) with rock outcrops and shallow rocky soils underlain by hard bedrock; (3) deep alluvial/ colluvial sandy soils within the steep mountain sideslopes containing 25 to 70 percent rock fragments occurring on moderately to strongly sloping areas; and (4) strongly sloping to steep convex ridges and sideslopes (9 to 40 percent) with shallow to moderately deep loam and clay loam soils containing 15 to 35 percent rock fragments forming from interbedded sandstone and soft shale (reddish). The hard sandstone exposures occur in a narrow paralleling pattern.

The northern portion of the Goslin Mountain area (MP A31.2 - A32.7) has a well-defined intermittent drainage pattern with strongly sloping to steep sideslopes that contain occasional wet areas. Soils in this portion are subject to a high water erosion hazard.

Willow Creek

The Willow Creek alternative would cross three key issue areas: *Rye Grass Draw, Willow Creek, Red Creek Basin Escarpment,* and the north portion of *Jesse Ewing Canyon.* (Refer to the proposed action discussion for descriptions of the Rye Grass Draw and Red Creek Basin Escarpment and the MAPCO alternative discussion for a description of Jesse Ewing Canyon.)

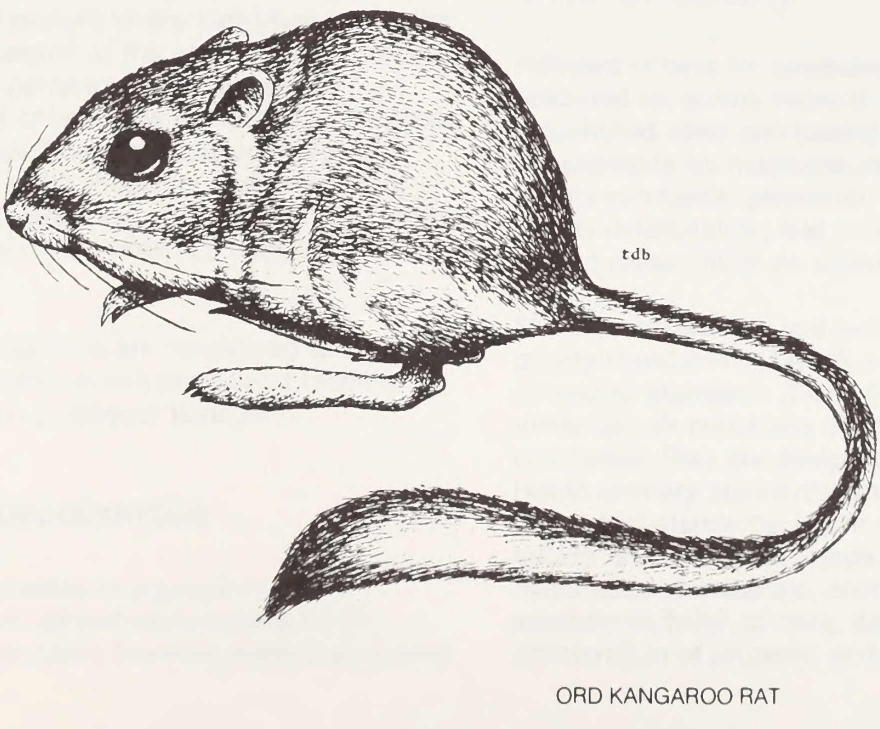
The *Willow Creek* area is located between MP A36 and A39 (Map A4-6). The alternative would cross mainly steep and very steep mountain sideslopes (from 30 to 65 percent and greater), consisting of shallow, rocky, sandy loam and loamy soils underlain by bedrock, of which 0.5 mile is hard bedrock. Included are areas of rock outcrops and smooth toe slopes (15 to 30 percent) with moderately deep and deep loamy soils containing more than 35 percent rock fragments ranging in size from 3 inches to 2 feet in diameter.

3.5.9 Agriculture

Table 3-19 identifies the grazing allotments that would be crossed by each of the alternatives. Maximum production would total 1 AUM per mile of pipeline.

CHAPTER IV

ENVIRONMENTAL CONSEQUENCES, MITIGATION AND MONITORING, AND LONG TERM ENVIRONMENTAL CONSEQUENCES



ORD KANGAROO RAT

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES, MITIGATION NOT INCLUDED IN PROPOSED ACTION AND MONITORING, AND LONG-TERM ENVIRONMENTAL CONSEQUENCES

This section discusses the environmental consequences (commonly referred to as impacts) of implementing the proposed action or alternatives. The affected environment is described in Chapter 3. The impacts are discussed to a level commensurate with the degree or severity of impact. Thus significant impacts are discussed in detail and insignificant impacts are merely summarized. The analysis takes into consideration the standard operating procedures and federal measures that are described in Appendix 2.

4.1 SIGNIFICANCE CRITERIA

The following criteria were used to determine the significance of impacts on each resource.

4.1.1 Water Resources

Significant impacts would result if flow were reduced by 10 percent in any individual river or by more than 1 percent at the point of inflow to Lake Powell. These percentages are based on experiences of critical flow decreases in the areas in question. Significant impacts are also considered to result if salinity were increased. Any increase in sediment to the Green River from Red Creek Watershed would be considered significant.

Impacts to floodplains are considered to be significant if aboveground permanent facilities were located on a 100-year floodplain.

4.1.2 Socioeconomics

Significant increases in population and employment are defined as increases of 10 percent or more above baseline projections based upon a review of current conditions. Other socioeconomic factors would be significantly affected when additional needs as a result of project impact exceeded 10 percent of baseline capacity.

4.1.3 Transportation Networks

Emphasis is placed on impacts to roads which are considered to be significant if the projected average annual traffic increases would reduce the level of service to Level D or below, as defined in the Highway Capacity Manual (American Association of State Highway and Transportation Officials 1965). Impacts would also be significant if a road were blocked for longer than 15 minutes at any one time. Impacts to existing pipelines would also be considered significant if normal flow were interrupted for any period of time.

4.1.4 Air Quality

Relevant criteria for assessing the significance of predicted air quality impacts are, in part, the established state and federal air quality program requirements for maintenance of ambient air quality standards, prevention of significant air quality deterioration, and protection of air quality-related values, such as visibility.

The national primary and secondary ambient air quality standards (NAAQS) and Wyoming ambient air quality standards (Table 4-1) were developed to identify air pollutants of concern (criteria pollutants). They are designed to protect human health (primary standards) and public welfare (secondary standards).Public welfare includes effects on soils, water, crops, vegetation, manufactured materials, animals, wildlife, weather, visibility, climate, damage to and deterioration of property, and hazards to

TABLE 4-1
NATIONAL AND WYOMING STATE AMBIENT AIR QUALITY STANDARDS

Pollutant	Federal Pollutant Standard: Primary	Federal Pollutant Standard: Secondary	Wyoming State Pollutant Standard
Total suspended particulate matter[a]	75 $\mu g/m^3$ annual geometric mean; 260 $\mu g/m^3$, maximum 24-hour average	60 $\mu g/m^3$ annual geometric mean[b]; 150 $\mu g/m^3$, maximum 24-hour average	Same as Federal secondary
Sulfur Dioxide	80 $\mu g/m^3$ (0.03 ppm), annual arithmetic mean; 365 $\mu g/m^3$ (0.14 ppm), maximum 24-hour average	1,300 $\mu g/m^3$ (0.05 ppm), maximum 3-hour average	60 $\mu g/m^3$ (0.02 ppm) annual arithmetic mean; 260 $\mu g/m^3$ (0.10 ppm), maximum 24-hour average 1,300 (0.5 ppm), maximum 3-hour average
Carbon monoxide[a]	10 $\mu g/m^3$ (9 ppm), maximum 8-hour average, 40 $\mu g/m^3$ (35 ppm) maximum 1-hour average	Same as primary	Same as Federal primary
Ozone	240 $\mu g/m^3$ (0.12 ppm)[c], maximum 1-hour average	Same as primary	160 $\mu g/m^3$ (0.08 ppm), maximum 1-hour average
Nitrogen dioxide	100 $\mu g/m^3$ (0.05 ppm), annual arithmetic mean	Same as primary	Same as Federal primary
Hydrocarbons corrected for methane[a,d]	160 $\mu g/m^3$ (0.24 ppm), 3-hour average	Same as primary	Same as Federal primary
Fluorides, as hydrogen fluoride	None	None	0.80 $\mu g/m^3$ (1.0 ppm), maximum 24-hour average
Fluorides, (gaseous form)[e]	None	None	0.3 $\mu g/m^3$, maximum 30-day average

Source: Code of Federal Regulations Title 40, part 50 and Wyoming Air Quality Standards and Regulations 1982.

Note: $\mu g/m^3$ - micrograms per cubic millimeter; ppm = parts per million.

[a]Not to be exceeded more than once per year.

[b]To be used as a guide in achieving the 24-hour standard.

[c]"The expected number of days per calendar year" with daily maximum ozone concentrations exceeding 240 $\mu g/m^3$ (0.12 ppm) must be less than or equal to 1.

[d]6 to 9 a.m., to be used as a guide in devising plans to achieve oxidant standards.

[e]As measured by the sodium formate method.

transportation, as well as effects on economic values and on personal comfort and well-being.

The prevention of significant deterioration (PSD) regulations (Table 4-2) have been established to protect air quality in those areas which are presently better than the ambient air quality standards and are more stringent than the NAAQS. Areas are protected by incremental increase limitations for sulfur dioxide (SO_2)and total suspended particulates (TSP). Under the Wyoming PSD regulations, all areas determined to have air quality better than the NAAQS (attainment areas) are classified as Class I and II.

Currently there are no clear objective criteria for judging adverse visibility impairment in Class I areas. However, the EPA visibility regulations (applicable to Class I areas) promulgates on December 2, 1980 (***Federal Register***, pp. 80084-80095), state that adverse visibility impairment will be determined on a *"...case-by-case basis taking into account the geographic extent, intensity, duration, frequency and time of visibility impairments, and how these factors correlate with (1) times of visitor use of the federal Class I area, and (2) the frequency and timing of natural conditions."*

More objective criteria for determining adverse visibility impairment are outlined in the EPA document entitled *"Workbook for Estimating Visibility Impairment"* (Latimer and Ireson 1980). That document suggests the following criteria: if a

TABLE 4-2
*ALLOWABLE AIR QUALITY INCREMENTS UNDER PREVENTION OF SIGNIFICANT DETERIORATION RESTRICTIONS (μg/m³)**

Wyoming Pollutant Standard	Class I	Class II
Total Suspended Particulate Matter		
Annual	5	19
24-hour	10	37
Sulfur Dioxide		
Annual	2	20
24-hour	5	91
3-hour	25	512

Source:. Clean Air Amendments 1977, Wyoming Air Quality Standards and Regulations 1982.
*μg/m³ = micrograms per cubic millimeter.

plume contrast or sky/terrain contrast change greater than plus or minus 0.10, or a plum discoloration corresponding to a delta E (*L*a*b) of 4, or a blue-red ration of 0.9 is predicted to occur on the worst day, the probability of adverse visibility impairment cannot be ruled out.

The existing mandatory Class I areas in the area of influence that are currently afforded visibility protection are administered by the U.S. Forest Service. The Forest Service has not yet established specific criteria for judging the significance of visibility impairment, except to state that visibility effects, such as changes in contrast, coloration, and visual range, should be considered. The Forest Service has not identified any *"integral vistas,"* which are views from within a Class I area, of landscape features located outside an area, that are afforded visibility protection.

The National Park Service and the Forest Service are in the process of identifying air quality related values and criteria for determining the adversity of effects on these values. When this process is complete, these criteria will be used in the PSD process.

Although the air quality analysis to be contained in this Environmental Impact Statement (EIS) is not for the purposes of obtaining a Wyoming or Utah Air Quality permit and would not satisfy that process, comparison of predicted ground-level pollution concentration to both the NAAQS and prevention of significant deterioration (PSD) increments provide guidelines for the determination of the significance or insignificance of an air quality impact.

4.1.5 Wildlife

Terrestrial Wildlife

Impacts to terrestrial wildlife species and habitats are considered to be significant if any crucial habitats (i.e., winter ranges, calving/fawning areas, leks, brooding areas, raptor nesting areas, etc.) were disturbed during the normal season of use. Additionally, impacts are considered significant if more than 1 percent of the total habitat available within a 1-mile wide corridor were disturbed. Indirect impacts caused by human population increases are considered to be significant if increases in poaching, wanton killing, and harassment exceeded 15 percent over present levels. At the present time, no research data has been established regarding significant increases in poaching, wanton killing, etc., caused directly from population increases due to various energy projects. Therefore, the 15 percent figure is based upon personal judgment and experience gathered from more than 25 years in the wildlife field. Additionally, these same significance criteria have been used in previous EIS's with no adverse comments (BLM 1982b).

Aquatic Wildlife

Downstream impacts to aquatic species are considered significant if instream construction activities persisted in a flowing stream for more than 8 consecutive hours, occur within a 2,000-foot radius of a spawning area, or crossed a spawning area. A spill would have significant impacts if the chemical additives in the slurry pipeline exceeded tolerance levels for major species.

Impacts to aquatic habitat in the Green River are considered significant if levels of sediment were increased by more than 100 milligrams per liter (mg/l) in a spawning area. Impacts caused by water diversion structures would be significant if the structure design allowed impingement or entrainment of important species.

Threatened or Endangered Species

Impacts to threatened or endangered species are considered significant if the biological assessment required under Section 7 of the Endangered Species Act determined that the species were in a *may affect* category. The biological assessment has been prepared by the Bureau of Land Management (BLM) (Appendix 5), and the U.S. Fish and Wildlife Services will respond with a biological opinion which will be included as part of the final EIS.

4.1.6 Visual Resources

Impacts are considered significant if modification in the landform and vegetation or the addition of a structure did not meet the standards of the BLM Visual Resource Management (VRM) Class or the Forest Service Visual Quality Objectives (VQO) for the area where the project would be located. The Contrast Rating System which analyzes contrasts in form, line, color, and texture of the landscape and the duration before the impact would be reduced to an acceptable condition, is used to determine significance.

4.1.7 Recreation Resources

The determination of positive or negative impacts upon the recreation resource is related to user expectation, availability of recreation opportunities, and the recreation setting. These three factors form the basis which determines whether experiences are high quality and positive, or low quality and negative.

Impacts to recreation resources are considered to be significant if either or both the following criteria were met:

> If the public's short-term sensitivity and perceived concerns about construction activity were high (thereby diminishing the quality of recreation experiences). Short-term is defined to be one recreation season beyond completion of construction.
>
> If the public's long-term sensitivity and perceived concerns about operation activity were medium to high (where the quality of the recreation experience would fail expectations). Long-term is defined to be 1 year through the life of a project (i.e., foreclosure of the Green River from Wild and Scenic River designation would be considered significant).

Short-term or long-term recreation impacts that would not generate public concern would be considered insignificant (i.e., impacts to an area not regularly used or to an area with ample recreation facilities).

4.1.8 Wilderness

Impacts are considered significant if any components of the proposed action or alternatives crossed the boundary of a BLM Wilderness Study Area (WSA) managed under the ***Interim Management Policy and Guidelines for Lands Under Wilderness Review*** (BLM 1980b) and Section 603(c) of the Federal Land Policy and Management Act of 1976.

Indirect impacts that would permanently impair the wilderness characteristics of a wilderness unit are also considered to be significant. An example of a significant indirect impact would be air quality degradation that would permanently impair visibility or the growth of *flora* and *fauna* within the boundaries of a wilderness unit. A major increase of visitors to a wilderness unit that would jeopardize solitude and natural characteristics is also considered to be a significant indirect impact.

4.1.9 Cultural Resources

Impacts to cultural resources are considered to be significant if any information were lost that would impede efforts to reconstruct the prehistory or history of the region. Impacts to any cultural resource on or eligible for inclusion on the National Register of Historic Places is also considered significant.

4.1.10 Soils and Vegetation

Impacts to soils are considered significant if the loss of soil and reduction of soil productivity and stability prevented successful restoration and recovery to near preconstruction conditions within 5 years.

Impacts to vegetation are considered significant if, following construction, more than 5 years were required to reestablish a ground cover to near preconstruction densities. Impacts are significant if poisonous or exotic plants invaded and occupied more than 15 percent of a specific vegetation type where none existed previously. The soils and vegetation significance criteria is based on (1) professional experience concerning the effectiveness of erosion control, reclamation, and revegetation measures as associated with similar kinds of projects, and (2) on the references cited in the preparation of the *Erosion Control, Reclamation, and Revegetation Program Checklist* developed by the Bureau of Land Management, Division of EIS Services (BLM 1982b).

4.1.11 Agriculture

Impacts to livestock grazing are considered significant if the amount of forage that was lost reduced livestock stocking rates in the affected pastures or allotments. Impacts to cropland are considered significant if more than 5 acres of land were irreversibly converted to other uses, if the viability of any of the lands were significantly diminished by the project, or if cropland outside of the project area were affected to the extent that more than 2 percent of the total cropland of the area were irreversibly converted to other use because of project development. The cropland acreage and percentage figures are based on professional experience gained from various agricultural areas and on the total acreage and type of cropland within the project and surrounding area.

4.2 PROPOSED ACTION

4.2.1 Water Resources

Plant Complex

The fertilizer plant would require variable amounts of water. At its initial operation level, it would utilize 4,560 acre-feet per year (ac-ft/yr); however, to determine impacts associated with water use, the maximum amount of water required (22,500 ac-ft/yr) is analyzed. In the following analysis, changes in flow and salinity were determined by using the Colorado River Simulation Model. The methodology and input data is detailed in the draft for the Uintah Basin Synfuels Development (BLM 1982b).

The withdrawal and use of 22,500 ac-ft/yr of water from Fontenelle Reservoir for use on the Chevron

Phosphate Project represents a 0.49 percent reduction in flow along the Green River as measured at Green River, Utah. This same consumptive use would increase salinity at Imperial Dam, California, by approximately 1 mg/l. The estimated cost per mg/l increase in salinity at Imperial Dam is $472,000 annually (BLM 1982b).

By itself, the change in flow from implementation of the proposed action does not represent a significant impact. However, considering the other interrelated projects mentioned in the Uintah Basin Synfuels Development EIS, significantly different changes in flow and salinity could occur based upon the cumulative water needs of other industrial development, agriculture, oil shale, energy development, and associated municipal uses. The EIS shows that depletions of the Green River could increase to 553,000 ac-ft/yr by the year 2000. This would be 206,000 ac-ft/yr of water over the current depletion of 347,000 ac-ft/yr and represents an approximate 5 percent reduction in flow of the Green River as measured at Green River, Utah. Considering other depletions in the Colorado River, water depletions could increase by 268,000 ac-ft/yr in the Colorado River Basin as measured at the inflow to Lake Powell; this represents an approximate 4 percent reduction in flow at Lake Powell. The resultant increases in depletion would increase salinity 19 mg/l at the mouth of the Green River, 14 mg/l at the inflow to Lake Powell, and 10 mg/l at Imperial Dam.

The cumulative impacts of the other developments and the water which would be used for the proposed action would increase depletions in the Green River to 575,500 ac-ft/yr of water by the year 2000. This would cause a 20 mg/l increase in salinity at the mouth of the Green River and an approximate 11 mg/l increase at Imperial Dam, of which Chevron's consumptive water use would represent approximately a 1 mg/l increase.

Davis Bottom Plant Process Water Pipeline

As much as 19,500 ac-ft/yr of plant process water would be pumped to the plant from Davis Bottom *via* a 16.4-mile long pipeline. Withdrawal of this water would have no noticeable effect on the flow at Davis Bottom. Similarly, the pipeline route would not affect the water resources of the area although it would cross several dry washes. The intake structure would be located in a floodplain, but, because of its small size, there would be no impacts on flood stage.

Red Creek Canyon Phosphate Slurry Pipeline

The Red Creek Canyon phosphate slurry pipeline would be 98.2 miles long, and would cross many dry washes and intermittent drainages. If these drainages were crossed during the dry period of the year, no significant impacts are expected except for an unquantifiable increase in sediment. The Green River crossing (Map A4-2) is not expected to significantly affect water resources of the area. Any additional sediment contributed from the Red Creek Watershed would be in conflict with the BLM Watershed Management Plan and, therefore, represents a significant impact.

The Green River would be crossed using trenching methods without the aid of cofferdams. The Bureau of Reclamation would cooperate in this effort by reducing the out-flow from Flaming Gorge so that construction could occur during minimum flow. Given this type of flow, suspended sediment concentrations are predicted to be 1,200 mg/l, 140 mg/l, and 3 mg/l, at 50, 100, and 200 feet downstream respectively (Chevron 1982a). These elevated levels of suspended sediment would occur only during actual in-water construction (portions of 3 to 4 days). This represents a short-term impact.

Two key issue areas would be encountered during construction in the Red Creek Watershed that could contribute sediment to the Green River: *Red Creek Canyon, Red Creek Basin Escarpment,* and the Red Creek Basin located between these two points.

Red Creek Basin and Canyon: The sediment that would be contributed to the Green River from Red Creek would be acquired primarily from Clay Basin and other areas in the upper part of the watershed. There would be a much smaller contribution from Red Creek Canyon. Due to the larger grain sizes in the canyon, proportionately less of the sediment from this source would reach the Green River.

Without careful construction techniques and strict enforcement of reclamation plans, those points where the pipeline would encounter unstable banks and bed (approximately 50 percent of the pipeline length in the watershed) could become sediment contributors to the Green River. Similarly, trenching through the canyon would disturb alluvial materials that are temporarily stored in banks and as bed materials. Chevron has indicated that it would be willing, if determined necessary, to remove unconsolidated materials; this may need to be done at scattered areas throughout the canyon. Although removing the alluvium would reduce the amount of sediment available for transport, construction would loosen materials that may temporarily increase sediment that would eventually reach the Green River. The normal construction practices for Red Creek Canyon as outlined by Chevron (Chapter 1) would provide for Red Creek to flow into a trench. However, Chevron's commitment to riprap with rock or sand/cement bags could leave the canyon in a more stable condition than presently exists. In addition, many large rocks would be exposed during construction; these should be appropriately placed to enhance channel stability. Sediment from Red Creek Canyon could reach the Green River; however, it would be a short-term impact lasting approximately 2 months, the degree of which would be determined by the runoff events that occur during and immediately after construction.

Red Creek Basin Escarpment: The amount of erosion that could take place on the Red Creek Basin Escarpment (Map A4-3) depends upon the vegetation and soil materials that are present, and the energy factors of slope and rainfall characteristics. This area does not have typical characteristics; the materials that would be excavated are unconsolidated rock debris rather than soil, and rainfall events are not well documented. Some conclusions can be drawn from the Red Creek Watershed Management Plan (BLM 1981c). The total watershed is comprised of 92,400 acres and delivers 111,000 tons of sediment annually to the Green River (89,000 suspended load and 22,000 bedload). Therefore, each acre of the watershed contributes an average of 1.20 tons of sediment per acre to the Green River.

For purposes of this discussion, the portion of the Red Creek Watershed that could contribute runoff with resultant sediment is the 646 acres along the Red Creek Basin Escarpment, of which about 18 acres would be disturbed or covered during excavation (assuming a 50-foot wide working area, 50-foot upperslope, and 50-foot overcast downslope area).

It is reasonable to assume that 1 inch of this material would be eroded or in a condition that would contribute to the sediment load in the area. The resultant volume would be 63,360 cubic feet of material or 1.45 acre feet of sediment (0.08 feet × 5,280 feet × 150 feet). It would be unrealistic to assume that all these materials would reach the Green River from Red Creek because of the opportunities for storage *en route*. In addition, there are great quantities of unconsolidated materials located directly in the stream channels throughout the Red Creek Watershed. There is evidence that the stream, particularly in the upper reaches, is incapable of transporting materials at the rate they are being supplied. However, should this sediment reach Red Creek and be transported to the Green River, it would represent a 4 percent increase in sediment load for the year of construction.

Should the centerline for construction encounter the springs or wet spots (Maps A4-1 and A4-3 through A4-6) or similar known wet areas, some sloughing could occur due to excavation or accumulation of water. Additionally, springs or wet spots could be diverted into the trench and outlet in a different area. This could be compensated by installing drain tiles in the trench where abnormally wet conditions are encountered.

Impacts associated with construction within floodplains would be short-term (during construction and for 1 year thereafter). Construction could contribute relatively small amounts of sediment to the river as previously discussed. In several places, the pipeline would be buried in the floodplains. Existing regulations require that pipelines be buried below maximum scour depth; therefore, there would be no effects on flood stage from construction and operation of this pipeline.

Summary

Implemention of the proposed action alone would not significantly affect the flow or salinity of the Green River; however, the cumulative affects of this project with other interrelated projects could cause significant impacts. Construction of the pipeline system would be in direct conflict with the BLM Watershed Management Plan, thus causing a significant impact. The pipeline would affect two key issue areas: Red Creek Watershed and Red Creek Basin Escarpment. These areas have been determined to require special construction and rehabilitation techniques. Implementation of any other components of the proposed action would not cause any significant impacts. (Refer to significance criteria for determination of possible impacts.) There would be no impacts to the floodplain from construction or operation of the proposed action.

4.2.2 Socioeconomics

The majority of the socioeconomic impact would result from the construction and operation of the proposed plant complex. Minor impacts would result from the construction and operation of the proposed phosphate slurry pipeline.

Plant Complex

Population: The proposed Chevron fertilizer plant would cause population increases in Sweetwater County, Wyoming. The greatest increase in population would occur in 1984, when Sweetwater County's population would increase by 3,589 (8 percent) above the baseline forecast. However, this would be a short-term impact lasting only 1 to 2 years during the peak construction period for the plant complex. It is assumed that within Sweetwater County, 89 percent of the in-migrants would live in Rock Springs, 5 percent in Green River, and the remainder would settle in the rural areas of the county. This is true for both 1984 and 1990. By 1990, the operation of the project would result in a 1,812 (4 percent) increase over baseline. This population growth would not result in a significant impact (see Table 4-3).

Employment and Income: The proposed annual average work force requirements for the Chevron project are given in Table 4-4. The peak year labor force requirement would occur in 1984. During that year, there would be 834 construction workers at the plant site. The operation work force would be on site in 1985, with a full operation labor force of 386 by 1987. Table 4-5 summarizes the direct and indirect employment for Sweetwater County attributable to the proposed project. The greatest increase in employment would occur in 1984 with the addition of 971 construction workers, a 45.5 percent increase in that sector. While this is a significant impact on the construction sector, the impact on total employment in the county that year would only be 6.7 percent.

The long-term impact of this project on employment in Sweetwater County is not significant. The proposed project would not have a significant impact on income (see Table 4-6).

Facilities/Services: Chevron would increase demands for personnel in most public service areas in Sweetwater County. These impacts are presented in Table 4-6. In 1984, the project would have a significant impact on the need for full-time city administration employees (11 percent), dentists (10 percent), and part-time library workers (14 percent). The only significant impact on the Sweetwater County services in 1990 is for part-time positions in the administration offices (33 percent). It should be noted that while the need for additional employees exceeds the significance criterion, the actual number of personnel required in these categories in all cases except the nurses' categories would be three or fewer positions.

Table 4-7 presents the additional demands on the facilities and equipment on the county. None of these increased needs would constitute a significant impact.

The impacts of the proposed project on personnel for the City of Rock Springs in 1984 would be significant (see Table 4-8). The greatest demand for additional personnel would be for six full-time sworn police officers. In 1990, the only employee category which would meet the significance criteria would be the need for part-time fire personnel. While

TABLE 4-3
POPULATION CHANGES RESULTING FROM THE PROPOSED ACTION (SWEETWATER COUNTY)

Category	1984	Percent Increase Over Baseline	1990	Percent Increase Over Baseline
Direct Population Increase due to Direct Construction Employment	2,124	5	--	0
Direct Population Increase due to Direct Operational Employment	--	0	1,119	2
Indirect Population Increase due to Indirect Employment from Construction	1,465	3	--	0
Indirect Population Increase due to Indirect Employment from Operations	--	0	693	1
TOTAL	3,589	8	1,812	4

Source: Chevron 1982b.

there would be a need for a 50 percent increase over the baseline, this represents an increase of only one part-time worker.

The only significant impacts on facilities in Rock Springs would occur in 1984 (Table 4-8). In that year, the proposed project would require an additional 0.42 million gallons per day capacity in the sewage treatment plant and six additional vehicles in the police department.

Table 4-9 presents the impacts of the proposed action on the city of Green River. The only significant impact on the city of Green River would be the need to add one support position in the police department in 1984.

Table 4-10 presents the net impacts of the proposed project on personnel needs and human services. While the table shows that several of these agencies would be significantly affected by the project, only one (task force on sexual assault) would require an increase of more than two positions above the baseline forecast in 1984. In 1990, the proposed project would not have a net effect larger than one employee in any of the human service agencies.

Education: The proposed project would have a significant impact on the need for personnel at both of the private schools in Sweetwater County in 1984 (Table 4-11). However, the actual additional personnel requirements would be small. The impact of the project in 1990 would not be significant.

The proposed project would have a significant impact on School District 1 in 1984, as is shown in Table 4-12. Although the impact of the project would be significant, it would not be necessary to add any additional classroom space, since the district is presently in the process of completing new facilities which would provide excess capacity even with Chevron. Chevron would not have a significant impact on School District 2.

Housing: The net impact of the project on housing demand in Sweetwater County would be the greatest in the construction years, peaking in 1984

TABLE 4-4
AVERAGE ANNUAL WORK FORCE REQUIREMENTS FOR THE PROPOSED ACTION

Task	1983	1984	1985	1986	1987	1990
Construction						
Plant Complex	387	834	670	4	0	
Power Transmission Lines and Substation	--	12	--	--	--	
Railroad Spur	--	45	--	--	--	
County Road Relocation		22				
Water Pipeline, Phosphate Slurry Pipeline, and Pump Station		154				
TOTAL	387	1,067	670	4	0	
Operation						
Phosphate Mine	174	174	174	182	182	182
Plant Complex			181	386	386	386
TOTAL	174	174	355	568	568	568

Source: Chevron 1982b.

TABLE 4-5
PROJECTED EMPLOYMENT IN SWEETWATER COUNTY RESULTING FROM THE PROPOSED ACTION

Category	1984	Percent Increase Over Baseline	1990	Percent Increase Over Baseline
Direct Construction Employment	971	45		0
Direct Operation Employment	--	0	386	70
Indirect Employment from Construction	670	--		--
Indirect Employment from Operation			239	
TOTAL	1,641	7	625	2

Source: Chevron 1982b.

TABLE 4-6
PROJECTED PERSONAL INCOME IN SWEETWATER COUNTY RESULTING FROM THE PROPOSED ACTION

Category	1984	1990
Total Personal Income*	42,683	15,623
Direct	28,597	11,296
Indirect	14,086	4,327
Per Capita Personal Income*	11,893	8,622
Direct	13,464	10,095
Indirect	9,615	6,244

Source: Chevron 1982b.
*Reported in thousands of 1982 dollars.

with 1,402 units (Table 4-13). Nearly 89 percent of the demand for these units would occur in Rock Springs, with the remaining demand split almost equally between Green River and the balance of the county. The net increase to the county as a whole would be less than 10 percent above the baseline; however, the project-related demand for 1,247 units in Rock Springs represents a 16 percent increase above the 1984 baseline forecast and would be, therefore, significant. The net impact of housing units in Rock Springs in 1990 is 547 units, or 3 percent above the baseline.

Fiscal: Table 4-14 shows a healthy financial condition projected for Sweetwater County through 1990, with the net benefit of the Chevron project alone reaching $240,100. Conversely, Rock Springs would experience the same continued general trend of revenue deficits with Chevron that the city would encounter under the baseline forecast. The net project effect would be to ease this deficit by $594,700 in 1984. However, an annual net negative impact of approximately $110,000 is projected during Chevron's operational years due to decline in sales and use tax distribution and the elimination of impact assistance funds.

Similarily, expenditures for Green River would exceed revenues in every forecast year, with or without the project, on account of the city's projected capital improvement program. However, the size of the annual deficit will be reduced by the net positive impacts of the Chevron project (Table 4-14). This positive impact is the result of two factors: (1) the city would receive a portion of the direct project revenues, and (2) only a small portion of the workers are projected to settle in Green River, thereby minimizing the need for public expenditures. Neither the net positive nor negative impacts of Chevron upon either city's revenues or expenditures would be significant.

Under the present finance system for Wyoming school districts, Sweetwater County School District 1 would receive a negative impact as a result of Chevron during the construction years. This would change to a net benefit after the plant was operational. Regardless, the district is projected to have a revenue surplus during every forecast year, with or without the project. Implementation of the proposed action would not significantly affect School District 2.

Social: As shown in Chapter 3, Sweetwater County and Rock Springs have experienced a great deal of social change over the past decade. The local people and governments have developed in-place mechanisms for coping with development and change, and planning has become an accepted government function. Given the moderate impact of Chevron on population, employment, and community resources and the widespread local support for the Chevron project, no significant social impacts are anticipated.

TABLE 4-7
PROJECTED NET IMPACT ON PERSONNEL FACILITIES, AND EQUIPMENT IN SWEETWATER COUNTY RESULTING FROM THE PROPOSED ACTION

	Projected Additional Personnel Needs			
Category	**1984**	**Percent Increase Over Baseline**	**1990**	**Percent Increase Over Baseline**
Personnel				
County Administration*				
Full-Time	3	11	1	3
Part-Time	0	0	2	33
County Sheriff				
Sworn Officers	3	9	2	6
Support Personnel	1	8	1	7
Health Care				
Physicians	2	6	1	3
Dentists	2	10	1	4
Nurses RN	14	7	7	3
Nurses LPN	5	8	2	3
Library				
Full-Time	2	7	1	3
Part-Time	1	14	0	0
Facilities and Equipment				
County Sheriff				
Number of Vehicles	1	5	1	5
Health Care				
Number of Hospital Beds	6	7	4	4
Number of Nursing Home Beds	7	1	3	3
Number of Ambulances	1	8	0	0

Source: Chevron 1982b.
Note: Projected personnel needs are based on standards used in the Industrial Siting Council permit application.
*Includes the County Personnel, Treasurer, and Assessor's Office.
**Primary care physicians only

Red Creek Canyon Phosphate Slurry Pipeline

The construction of the proposed phoshate slurry pipeline, water pipeline, and booster pump station would require one spread (work force group) consisting of approximately 154 persons. This crew would move along the pipeline route as the work progressed from the existing mine site northward to the proposed plant complex site. Initially, the crew would be based in Vernal and then, ultimately, in Rock Springs. As the construction of the pipeline is scheduled to be completed within 3 months, no

TABLE 4-8
PROJECTED NET IMPACT ON PERSONNEL FACILITIES, AND EQUIPMENT IN ROCK SPRINGS RESULTING FROM THE PROPOSED ACTION

	Projected Additional Personnel Needs			
	1984	Percent Increase Over Baseline	1990	Percent Increase Over Baseline
Personnel				
City Administration				
Full-Time	4	14	2	6
Part-Time	0	0	0	0
Police Department				
Sworn Officers	6	15	3	7
Support Personnel	2	13	1	6
Fire Protection				
Full-Time	4	13	2	6
Part-Time	1	50	1	50
Facilities and Equipment				
Sewage Treatment Capacity (MGD)*	0.42	15	0.20	6
Water Treatment and Distribution Capacity (MGD)*	0	0	0	0
Police Department Number of Vehicles	6	15	3	7

Source: Chevron 1982b.
Note: Projected facilities/equipment needs are based on standards used in the Industrial Siting Council permit application.
*MGD = Millions of gallons per day.

significant impacts on either Vernal or Rock Springs are expected from this work force. Some unquantifiable impacts may occur from a small percent of this work force living in trailers along the pipeline route during construction phase.

The operation of the slurry pipeline would reduce the amount of phosphate that would be hauled from the existing mine to the railroad at Phoston, Utah. This could possibly result in the loss of jobs for 15 truck drivers. However, since the truck drivers are contract haulers, the ultimate loss is unpredictable as they may move to other jobs. At the same time, an increase of eight positions would be required at the mine. Therefore, the net loss in jobs would be insignificant.

The operation of the booster pump station in Sweetwater County, Wyoming, would require two people per 8-hour shift for a total work force of six persons. The proposed plan is for this work force to reside in Rock Springs and travel to the booster

TABLE 4-9
PROJECTED NET IMPACT ON PERSONNEL, FACILITIES, AND EQUIPMENT IN GREEN RIVER RESULTING FROM THE PROPOSED ACTION

	Projected Additional Needs			
Category	**1984**	**Percent Increase Over Baseline**	**1990**	**Percent Increase Over Baseline**
Personnel				
Police Department				
Sworn Officers	1	4	0	0
Reserve Officers	0	0	0	0
Support Personnel	1	10	0	0
Fire Protection				
Firefighters*	0	0	1	2
Facilities and Equipment				
Sewage Treatment				
Capacity (MGD)*	0.02	1	0.01	1

Source: Chevron 1982b.
Note: Projected facilities/equipment needs are based on standards used in the Industrial Siting Council permit application.
*Includes a full-time fire chief, assistant chief, and two captains.
*MGD = Millions of gallons per day.

pump station on the existing county road. Severe winter storms make the road impassable at times. Chevron has stated that if this occurred, the workers on shift would continue to work, taking turns, until the new shift can make it to the station. This work force, due to weather conditions, may decide to reside in the near vicinity. If this occurs, some impact could occur on Sweetwater County, Wyoming, or Daggett County, Utah, to provide services for this work force. However, there is no way to predict if this would occur, or to what extent.

Summary

Generally, implementation of the proposed action would have no significant impacts on population, employment, personal income, housing, educational systems, and fiscal and social conditions in Wyoming or Utah. While operation of the phosphate slurry pipeline could eliminate the present need for contract truckers, this loss would be considered insignificant as noted in the significance criteria. Some small unquantifiable impacts may occur from some construction workers living in trailers along the pipeline route. In addition, unquantifiable impacts could occur to Seeetwater or Daggett counties during periods of adverse weather conditions.

TABLE 4-10
PROJECTED NET IMPACT ON PERSONNEL NEEDS AND HUMAN SERVICES IN SWEETWATER COUNTY RESULTING FROM THE PROPOSED ACTION

Service	Projected Additional Personnel Needs 1984	Percent Increase Over Baseline	1990	Percent Increase Over Baseline
Public Assistance and Social Service				
Social Workers	0.5	7	0.5	6
Public Assistance and Clerical	1.0	11	0.5	5
Job Service				
Personnel	2	13	1	6
Protection and Parole				
Personnel	0	0	0	0
Southwest Counseling Service				
Professional Staff	1	14	0	0
Clerical Staff	0	0	0	0
Task Force on Sexual Assault				
Staff	0.5	11	0	0
Volunteers	3	11	1	3
Young Womens Christian Association				
Full-Time Staff	2	9	1	4
Part-Time Staff	1	17	1	14
Southwest Wyoming Alcoholism Rehabilitation Association				
Staff	0	0	0	0

Source: Chevron 1982b.
Note: Projected facilities/equipment needs are based on standards used in the Industrial Siting Council permit application.

TABLE 4-11
PROJECTED NET IMPACT ON PERSONNEL NEEDS OF PRIVATE SCHOOLS AND WESTERN WYOMING COLLEGE, IN SWEETWATER COUNTY RESULTING FROM THE PROPOSED ACTION

Service	Projected Personnel Needs* 1984	Percent Increase Over Baseline	1990	Percent Increase Over Baseline
Sweetwater County Catholic School	2	14	1	6
Sweetwater County Christian School	1	14	0	0
Western Wyoming College	6	8	3	4

Source: Chevron 1982b.
Note: Projected facilities/equipment needs are based on standards used in the Industrial Siting Council permit application.
*Number of teachers.

TABLE 4-12
PROJECTED NET IMPACT ON ENROLLMENT, CLASSROOMS, AND STAFF, SCHOOL DISTRICTS 1 AND 2, IN SWEETWATER COUNTY RESULTING FROM THE PROPOSED ACTION

Category	1984	Percent Increase Over Baseline	1990	Percent Increase Over Baseline
Enrollment				
K-6	387 (24)	11 (1)	206 (12)	5 (1)
7-12	247 (36)	11 (3)	132 (9)	5 (1)
Total	634 (60)	11 (2)	338 (21)	5 (1)
Classrooms				
K-6	19 (1)	11 (1)	11 (0)	6 (0)
7-12	13 (1)	12 (1)	7 (1)	6 (1)
Total	32 (2)	11 (1)	18 (1)	6 (1)
Staff				
Teachers K-6	19 (1)	11 (1)	11 (0)	6 (0)
Teachers 7-12[1]	15 (2)	12 (3)	8 (0)	5 (0)
Special Education	4 (0)	10 (0)	2 (0)	4 (0)
Professional Support[2]	4 (0)	10 (0)	2 (0)	4 (0)
Administration[3]	7 (0)	11 (0)	4 (1)	5 (3)

Source: Chevron 1982b.

[1] Special Education areas include: remedial, speech, gifted and talented, mentally retarded, trainable mentally retarded, physically handicapped, emotionally disturbed, culturally different, learning disability, and others.

[2] Professional support includes: clerical, pupil services, guidance counselors, social workers, nurses, psychology personnel, staff services, staff training personnel, librarians, and media.

[3] Administration includes: superintendents, secretaries, assistants of instructional support, principals, assistant principals, directors, coordinators/supervisors, clerks, assistant superintendent of business affairs, business managers, and personnel directors.

NOTE: Figures not identified in parentheses are for School District 1; figures identified in parentheses are for School District 2.

TABLE 4-13
PROJECTED HOUSING DEMAND IN SWEETWATER COUNTY RESULTING FROM THE PROPOSED ACTION

County/Community	Total Housing Units	Single Family Units	Multi Family Units	Mobile Home Units
1984 Sweetwater County	1,402	659	318	425
Rock Springs	1,247	565	284	398
Green River	70	35	12	23
Balance of County	85	59	22	4
1990 Sweetwater County	547	244	171	132
Rock Springs	487	226	154	107
Green River	26	18	3	5
Balance of County	34	0	14	20

Source: Chevron 1982b.

TABLE 4-14
PROJECTED NET IMPACT ON REVENUES AND EXPENDITURES IN SWEETWATER COUNTY AND JURISDICTIONS RESULTING FROM THE PROPOSED ACTION

Jurisdiction	Category	1984	1990
Sweetwater County	Total Revenue	$23,342.4	$38,518.6
	Total Expenditures	17,029.1	18,002.7
	Revenue Surplus/Deficit	6,313.3	20,515.9
	Net Cost/Benefit of Chevron Project	+ 158.5	+ 240.1
City of Rock Springs	Total Revenue	12,762.5	13,220.9
	Total Expenditures	17,776.2	14,378.8
	Revenue Surplus/Deficit	− 5,013.7	− 1,137.9
	Net Cost/Benefit of Chevron Project	+ 594.7	− 110.5
City of Green River	Total Revenue	9,756.6	10,894.4
	Total Expenditures	10,708.4	11,736.0
	Revenue Surplus/Deficit	− 951.9	− 841.6
	Net Cost/Benefit of Chevron Project	+ 559.9	+ 112.2
Sweetwater County School District 1	Total Revenue	32,137.7	59.144.9
	Total Expenditures	24,495.9	27,496.0
	Revenue Surplus/Deficit	7,641.7	31,648.9
	Net Cost/Benefit of Chevron Project	− 791.7	+ 96.2
Sweetwater County School District 2	Total Revenue	18,442.6	33,217.3
	Total Expenditures	10,552.2	11,852.5
	Revenue Surplus/Deficit	7,890.5	21,364.7
	Net Cost/Benefit of Chevron Project	− 225.0	− 137.6

Source: Chevron 1982b.
Note: Figures given in thousands of 1982 dollars.

4.2.3 Transportation Networks

Plant Complex

Rock Springs and Green River residents would reach the fertilizer plant *via* Wyoming State Highway 430. The largest impact on this road would occur during the construction years (mid-1983 through mid-1985) with the increase of traffic volume due to construction workers commuting, and the truck transport of construction materials. This increased volume could result in increased traffic congestion, increased commuting time, and possibly increased traffic accidents. The proposed action includes the construction of a left-turn storage lane, acceleration/deceleration lane, and through traffic lanes. Further, Chevron has committed to staggering shifts and busing if additional mitigation were required. Therefore, no significant impacts on this highway are anticipated.

An unknown quantity of project-induced traffic would be dispersed throughout the City of Rock Springs. The company is committed to developing a worker housing plan to reduce the congestion potential at key intersections. Consequently, no significant in-town transportation impacts are anticipated.

Red Creek Canyon Phosphate Slurry Pipeline

The construction of the proposed pipeline may cause some traffic problems on U.S. Highway 191 during construction. This would result from movement of personnel and equipment to the construction site. Since the pipeline would be buried under the highway, no significant impacts would result.

Operation of the slurry pipeline would result in a reduction of truck traffic from the mine site to Phoston, Utah. This would result in the reduction of 30 round trips per day by 15 46-ton trucks on U.S. Highway 191 and U.S. Highway 40. This would result in a positive impact on the traffic flow through Vernal. The pipeline would be in conflict with the existing MAPCO pipeline at the head of Rye Grass Draw where room will be limited for the construction of a new pipeline. Possible damage and/or shutdown of the MAPCO liquid hydrocarbon transportation pipeline could occur. Any disruption of the MAPCO pipeline would be a significant impact.

Railroad Spur

The 8.7-mile long railroad spur would cause no significant transportation impacts, since no roads or rail lines would be crossed. Rail traffic on the spur would not significantly increase the volume on the Union Pacific east-west line out of Rock Springs.

Microwave System

No significant transportation impacts would occur as a result of construction of this component.

County Road Relocation

The proposed action includes the relocation of County Road 4-27. The relocated road would be aligned northeast-southwest, intersecting Highway 430 approximately 1.2 miles southeast of its current junction. People traveling south on 4-27 would be required to travel about 1 mile farther than at present, but this impact would be insignificant.

Summary

Implementation of the proposed action slurry pipeline could have a positive impact on the traffic flow from Vernal to Rock Springs, but an unquantifiable negative impact to the truck drivers who presently haul phosphate from Vernal to Phoston, Utah. Impacts to U.S. Highway 191 from construction of the pipeline would be temporary and, therefore, insignificant. Transportation of liquid hydrocarbon through the existing MAPCO pipeline could be disrupted by construction of this pipeline causing a significant impact as indicated in the significance criteria; however, no other significant impacts to transportation networks are anticipated from implementation of the proposed action. Increased traffic during plant construction may lead to traffic congestion and an increase in accidents.

4.2.4 Air Quality

Plant Complex

The impacts of the operation of the fertilizer plant were determined by modeling the design emissions from the plant, using techniques and models approved by the State of Wyoming and the Environmental Protection Agency (EPA). Modeling was done for all pollutants emitted in significant amounts, for which ambient standards have been established. Table 4-15 summarizes the plant emissions and the significance levels, taken from Wyoming's PSD regulations. As indicated, the pollutants emitted in greater than significant amounts are fluoride, TSP, sulfur dioxide, nitrogen dioxide, and acid mist. There are no ambient standards established for acid mist.

Meteorology: Meteorological data selected for dispersion modeling combine observations made from the Rock Springs airport and from a 200-foot tall tower operated by Pacific Power and Light (PP&L) at its Jim Bridger Power Plant. The Jim Bridger Plant is located about 15 miles northeast of the proposed plant site. Data from the two sites were used at the request of the Wyoming Department of Environmental Quality (DEQ). Surface observations and atmospheric stability determinations were taken from Rock Springs, and upper-level wind speed and wind direction were obtained from the 200-foot level of the PP&L tower.

Modeling Results: Modeling showed that the proposed plant would meet all applicable National and Wyoming State ambient air quality standards and PSD increments. Table 4-16 summarizes this modeling. This project would have no measurable impact on the Class I areas identified in Chapter 3.

No secondary impact analysis has been done on the emissions associated with this project. Rock Springs would be most affected by these secondary impacts because of increased population and associated emissions that would occur (i.e., automobile exhaust, home construction and land development). Wyoming officials have noted a decreasing trend in total suspended particulate

TABLE 4-15
SUMMARY OF EMISSION RATES AND SIGNIFICANCE LEVELS

Pollutant	Emission Rate (tons per year)	Significance Level (tons per year)
Fluorine	60.98	3
Total Suspended Particulates	197.41	25
Sulfur Dioxide	2,799.85	40
Carbon Monoxide	31.39	100
Nitrogen Dioxide	253.16	40
Volatile Organic Carbon	4.39	40
Acid Mist	95.81	7

TABLE 4-16
MAXIMUM PREDICTED POLLUTANT CONCENTRATIONS RESULTING FROM OPERATION OF THE PLANT COMPLEX

Pollutant	Averaging Period	Maximum Predicted Plant Impact	Model Used	Allowable PSD Increment	Predicted Background	Maximum Predicted Impact With Background	Wyoming Allowable Ambient Air Quality Standard
Total Suspended Particulates	24-hour	29.5	Valley	37	29.6	59.1	150
	Annual (geometric mean)	8.3	Valley	19	13.8	22.1	60
Sulfur Dioxide	3-hour	191.1	Valley	512	39.5	230.6	1,300
	24-hour	57.6	ISCST	91	7.9	65.5	260
	Annual	4.1	Valley	20	1.5	5.6	60
Nitrous Oxides	Annual	4.8	Valley	None	2.5	7.3	100
Fluoride	24-hour	0.43	ISCST	None	less than 0.22	0.65	0.80

Note: All concentrations in micrograms per cubic meter.

(TSP) concentrations in Rock Springs. This is the only pollutant for which standards have been threatened or exceeded. Monitoring will continue to assure that the secondary impacts of the project do not adversely affect the noted TSP improvement nor affect the attainment status of other pollutants.

Visibility: Several indices of visibility impairment are dicussed in the air quality permit application for the fertilizer complex (Chevron 1982b). The most important measures, coefficients of contrast and haze, suggest that there would be no perceptible visibility contrast change or general haze at the nearest Class I area (Bridger Wilderness). Table 4-17 presents the values of contrast and haze coefficients. Absolute values of coefficients less than 0.10 indicate that no perceptible visibility impact would occur. Because the Savage Run Wilderness Area is farther away from the project than the Bridger Wilderness Area, and because the visibility screening techniques were based on selected worst-case meteorology, it can be stated that the work performed suggests that there will be no perceptible visibility contrast or general haze at the Savage Run Wilderness Area, as well.

Very close to the fertilizer complex, visibility changes would likewise be insignificant. The reduction in visual range induced by plume material and fugitive dust emitted from the plant would be 0.29 percent, far below the limit of perceptible visual range reduction of 5 percent. The reduction in visual range due to general haze in the vicinity of the plant will be 0.43 percent, also below the perceptible limit.

Computations of plume opacity near each of the plant stacks indicate that the plume from the ammonium phosphate plant stack may occasionally be visible for about 250 meters during infrequent and short duration meteorological episodes. All other plant stack plumes would be invisible.

Davis Bottom Plant Process Water Pipeline

The construction of this pipeline would create emissions of both particulate matter and gaseous pollutants during construction. Construction sources would include site preparation activities, right-of-way clearing, vehicle travel over unpaved roads, pipeline burial, and heavy equipment operation. There are no significant emissions expected from the operation of the pipeline, because electrically powered pump stations will be used and the pipeline right-of-way would be reclaimed.

The Davis Bottom water pipeline will be 15.7 miles long and, based on a linear interpolation, the emissions from this source would be approximately 1/5 of those shown in Table 4-18 and 4-19.

TABLE 4-17
VISIBILITY IMPAIRMENT AT BRIDGER WILDERNESS

Visibility	Designation	Coefficient
Plume/Sky Contrast	(C_1)	−0.0014
Plume/Terrain Contrast	(C_2)	0.0042
General Haze Coefficient	(C_3)	0.0063

TABLE 4-18
UNCONTROLLED FUGITIVE DUST EMISSIONS RESULTING FROM PIPELINE CONSTRUCTION

Activity	Fugitive Dust Emissions Project Total*
Pipeline Construction (right-of-way clearing)	71.3
Pipeline Burial	58.5
Wind Erosion from Exposed Areas	81.5
TOTAL	211.3

*Total tons from project

TABLE 4-19
GASEOUS EMISSIONS RESULTING FROM PIPELINE CONSTRUCTION

Equipment Type	EMISSIONS*				
	Carbon Monoxide	Hydrocarbons	Nitrogon Dioxide	Sulfur Dioxide	Total Suspended Particulates
Tracklaying Tractors (4)	0.7	0.2	2.5	0.2	0.2
Wheeled Dozers (3)	0.9	0.2	6.4	0.5	0.2
Off-Highway Trucks (11)	6.2	2.0	35.2	2.1	1.2
Miscellaneous (3)	0.6	0.2	2.9	0.2	0.2
TOTAL	8.4	2.6	47.0	3.0	1.8

*Total tons from project

These emissions are expected to be emitted over a construction period of approximately 3 months. Because they are spread out over a broad geographic area, and because they are temporary rather than permanent emission sources, it is anticipated that there will be no significant impact on air quality of the region due to the construction of the Davis Bottom plant process water pipeline.

Red Creek Canyon Phosphate Slurry Pipeline

The construction of this pipeline would create emissions of both particulate matter and gaseous pollutants during construction. Construction sources would include site preparation activities, right-of-way clearing, vehicle travel over unpaved roads, pipeline burial, and heavy equipment operation. There are no significant emissions expected from the operation of the pipeline, because electrically powered pump stations would be used and the pipeline right-of-way would be reclaimed.

Emissions for the construction of the 98.2-mile long phosphate slurry pipeline from Vernal to the Rock Springs plant were calculated by Chevron using various modified published fugitive dust emission factors for TSP and emission factors from EPA's publication, AP-42, for gaseous emissions from construction equipment activity. The method for calculating these emissions is described in Chevron's Industrial Siting Council permit application (Chevron 1982b). The calculated particulate emissions are presented in Table 4-18. The calculated gaseous emissions are presented in Table 4-19.

These emissions are expected to be emitted over a construction period of approximately 3 months. Because they encompass a broad geographic area, and because they are temporary rather than permanent emission sources, it is anticipated that there would be no significant impact on the air quality of the region due to the construction of the Red Creek Canyon phosphate slurry pipeline.

Railroad Spur

Gaseous emissions would be generated from the operation of locomotives along the planned 8.7-mile long rail spur to the plant. The quantity of these emissions has been calculated using EPA's AP-42 emission factors and the results are presented in Table 4-20. These emissions were considered in determining the operation impact of the plant complex, discussed earlier in this chapter. Emissions from construction are not expected to have any significant impact on the air quality of the region.

TABLE 4-20
GASEOUS EMISSIONS RESULTING FROM OPERATION OF LOCOMOTIVES

Pollutant	Amount (tons per year)
Sulfur Dioxide	0.64
Nitrogen Dioxide	4.14
Carbon Monoxide	1.46
Volatile Organic Carbon	1.06
Total Suspended Particulates	0.29

Microwave System

Chevron would construct an 8 foot by 8 foot building and a microwave tower at the four sites described in Chapter 1. The emissions from this construction would be negligible and there would be no significant impact on ambient air quality. No pollutants would be generated by the operation of the microwave system; therefore, there would be no impact on air quality due to the operation of the proposed action.

County Road Relocation

The relocation involves 1.6 miles of county road. The emissions from this construction would be negligible and there would be no significant impact on ambient air quality.

Summary

In general, construction and operation of the proposed action and related components would have no significant impacts to air quality. However, monitoring will be required in Rock Springs to assure that TSP concentrations are kept to a minimum. All other emissions will be minimized through Chevron's emission control proposals. (Refer to Chapter 1 and mitigation and monitoring section of this chapter.) These emissions would be within the allowable limits identified in the significance criteria.

4.2.5 Wildlife

If Chevron adheres to its construction schedule (Chapter 1), most of the direct impacts to wildlife populations would be avoided. Disturbance from construction activities to crucial habitat area during critical times of the year would be minimized.

Implementation of the proposed action and all components would disturb some threatened and endangered species including about 341 acres of white-tail prairie dog range which could furnish habitat for the endangered black-footed ferret (Table 4-21). Impacts to the federally listed black-footed ferret by removal of prairie dog colonies could include direct mortality to any ferret underground in the path of construction machinery. Before any prairie dog habitat is disturbed by project facility construction, surveys would be required by the Fish and Wildlife Service to determine if ferrets are present. Populations of this animal are so low that any losses could have severe adverse impacts. Short-term removal of prairie dog habitat should have no significant impacts to the ferret beyond possible direct mortality as previously mentioned. Permanent removal of an estimated 198 acres of prairie dog habitat should not result in any significant impacts because of the total amount of prairie dog range that is available.

Any reduction in flow in the Green River could have significant, adverse impacts to the endangered fish species indigenous to this river below Flaming Gorge Reservoir (FWS 1982).

Whooping cranes could fly over some of the proposed action facilities, but no adverse impacts to these birds are anticipated since there would not be any project facilities near any known resting or staging areas.

Winter bald eagle habitat could be found along the Green River where the phosphate slurry pipeline would cross the river (about MP 33.5). Construction of the pipeline is planned during summer months. If Chevron adheres to this schedule, no adverse impacts to the bald eagle are anticipated. The endangered peregrine falcon could range over portions of the proposed action pipeline, but none of the project facilities would be near any known active eyries. Therefore, no adverse impacts are anticipated.

Plant Complex

The fertilizer plant complex, including the gypsum impoundment and cooling pond, would remove approximately 530 acres of yearlong pronghorn range and 531 acres of yearlong deer range from production for the life of the project. These habitat losses are not expected to be significant because they represent less than 1 percent of the available habitat in the surrounding area.

TABLE 4-21
ACRES OF WILDLIFE HABITAT DISTURBED BY THE PROPOSED ACTION

SPECIES AND TYPE OF HABITAT	PLANT COMPLEX AND FACILITIES[1]	PLANT PROCESS WATER PIPELINE AND FACILITIES	PHOSPHATE SLURRY PIPELINE AND FACILITIES	RAILROAD SPUR	COUNTY ROAD	TOTAL
MULE DEER						
Crucial Winter Range	0 (0)[2]	0 (0)	209 (4.25)	0 (0)	0 (0)	209 (4.25)
Normal Winter Range	14 (0)	53 (11)	211 (0.75)	0 (0)	0 (0)	278 (11.75)
Summer Range	0 (0)	0 (0)	81 (0)	0 (159)	0 (29)	81 (159)
Yearlong Range	3 (531)	81 (5)	0 (0.50)	0 (0)	0 (0)	84 (565.50)
ELK						
Normal Winter Range	5 (0)	26 (15)	358 (4.50)	0 (0)	0 (0)	389 (19.50)
PRONGHORN						
Crucial Winter Range	0 (0)	0 (0)	65 (3)	0 (0)	0 (0)	65 (3)
Normal Winter Range	10 (1)	86 (19)	142 (0)	0 (0)	0 (0)	238 (20)
Summer Range	0 (0)	0 (0)	119 (0)	0 (0)	0 (0)	119 (0)
Yearlong Range	7 (530)	14 (14)	31 (1.25)	0 (159)	0 (29)	52 (740.25)
SAGE GROUSE						
General Distribution Range	5 (1)	9 (9)	375 (0.25)	0 (159)	0 (29)	389 (198.25)
WHITETAIL PRAIRIE DOG						
General Distribution Range	6 (1)	18 (9)	119 (0)	0 (159)	0 (29)	143 (198)

[1]Numbers outside of parentheses indicate short-term losses, numbers inside the parentheses indicate long-term losses.
[2]Facilities include power transmission line, substations, access roads, and pump stations, as appropriate (see Chapter 1).

There would be additional losses of habitat associated with project activities. These types of losses would be to areas of habitat that would not physically be removed, but are within a zone of influence around the project area. This area would become temporarily unusable by wildlife because of isolation, noise, dust, and similar factors. The zone of influence would vary in size for each species of wildlife under consideration, because each species has a different tolerance toward humans and their activities, and each species has a different cruising radius.

From 1983 to 1985, human population in the area around the plant complex (Sweetwater County) would increase by about 8 percent due to project and support personnel moving into the area. Therefore, it is estimated that poaching and wanton killing of wildlife would increase during this period by no less than 8 percent over present levels (based upon a straight-line projection). It is also anticipated that applications for limited hunting permits would increase at the same rate, thus reducing the chances of local, long-time residents obtaining these permits at the same rate they now enjoy. General hunting and fishing pressure and competition for space would also increase by about 8 percent from implementation of the project.

About 17 acres of winter/yearlong deer range, 17 acres of normal winter pronghorn range, and 5 acres of winter elk range would be lost over the short term due to power transmission line construction. Losses of big and small game habitat are not expected to be significant because the total acres that would be lost due to power transmission line construction would be short term and would represent less than 1 percent of the total available habitat. Some big game animals could be temporarily displaced during the construction phase of the power transmission line, but the animals are expected to quickly adjust to the line and reoccupy this area. Approximately 5 acres of sage grouse and 6 acres of whitetail prairie dog habitat would also be lost over the short term because of power transmission line construction.

The power substation would cover about 1 acre of yearlong deer range and 1 acre of winter pronghorn range for the life of the project. Additionally, about 1 acre of sage grouse and whitetail prairie dog habitat would be lost for the life of the project. These habitat losses are not expected to be significant since they comprise less than 1 percent of the total available habitat in the area.

The gypsum impoundment would have a permanent standing water area varying from approximately 68 to 142 acres depending upon the season. The water in this pond would be highly acidic (pH 2.5). Impacts to native wildlife species could be extremely significant, because any free water located in this arid area would be very attractive to native wildlife, and the potential for mortality would be high. However, studies in California (Zitney 1978) indicated that contact with wastewater from a nitrogen fertilizer plant containing a pH of 2.5 had no apparent external effect upon waterfowl, probably because the wastewater contained no surfactants which could break down the protective oils on their feathers.

Birds taking this water internally, however, experienced debilitating or lethal effects in most cases. It was also demonstrated that birds which initially drank the wastewater did not instinctively avoid ingesting it even after experiencing initial irritation. In fact, birds appeared to consume even greater quantities in an apparent effort to soothe the irritation. This response caused acute lethal poisoning to the test birds.

Estimates of numbers of birds that would be potentially affected by the gypsum impoundment cannot be reliably calculated, but losses could be heavy because any open water located in this area would be attractive to birds. Potential losses can be estimated because from 1974 to 1982, 4,531 sick or dead birds were retrieved from trona processing evaporation ponds located northwest of Rock Springs, Wyoming (FWS 1982c). These ponds, which covered 2,400 acres on four sites, were highly alkaline (pH 10.5); the gypsum pond would be acidic.

In a test study, rabbits completely avoided wastewater for periods up to 48 hours even though it was the only water available (Zitnery 1978). Based upon these test results, mortality to mammals is not anticipated at the Chevron plant site. The deposition of fluorine on vegetation normally used for food by pronghorn and sage grouse (Maps A4-7A and 7b) would cause fluorosis, which is a bone disease (Suttie 1971).

Davis Bottom Plant Process Water Pipeline

The plant process water pipeline would disturb about 134 acres of deer range over the short term (3 to 5 years); about 16 acres over the life of the project (Table 4-21). About 26 acres of elk range would be disturbed for the short term (3 to 5 years) by implementation of this system; about 15 acres would be lost for the life of the project. Approximately 100 acres of pronghorn range would be lost over the short term; about 33 acres would be lost for the life of the project.

General sage grouse range totaling 9 acres and whitetail prairie dog range totaling 18 acres would be lost for the short term and about 9 acres of each would be lost for the life of the project. These habitat losses are not anticipated to be adverse or significant because the total acres that would be lost represent less than 1 percent of the total available habitat.

An unknown number of small burrowing rodents would be lost on 150 acres (134 acres short term; 16 acres long term). While these losses would be heavy in the disturbed area, these species have a high reproductive rate; therefore, repopulation would be rapid once reclamation was completed.

Red Creek Canyon Phosphate Slurry Pipeline

The proposed action phosphate slurry pipeline would disturb about 501 acres of mule deer habitat, 358 acres of elk habitat, and about 357 acres of pronghorn range over the short term (Table 4-21). In addition, about 375 acres of sage grouse habitat and 119 acres of whitetail prairie dog habitat would also be disturbed for the short term. These losses of habitat are not anticipated to be significant because the total acres that would be lost represent less than 1 percent of the total available habitat.

Small mammals and their habitats would be lost over the short term on about 635 acres. While heavy, these losses are not expected to be significant because of the amount of habitat that is available in the general area. Once reclamation is completed, repopulation would be rapid because of the high reproductive potential of these species.

Riparian vegetative habitat would be disturbed over the short term on about 3 acres at the Green River crossing site. In addition, the effects of construction in the river channel would cause the temporary loss of about 111 square yards of benthic substrate (river bottom) for each 10 feet of river crossed. This impact is expected to be localized, short term, and of limited biological significance (BLM 1981b).

Certain wildlife species could be adversely affected if pipeline and facility construction occurred in their habitats during critical periods in their life cycles. As noted in Chapter 3, adherence to the proposed construction schedule would avoid most of the critical periods, thus direct impacts are not anticipated.

Some harassment and displacement of big game animals could occur in the vicinity of the pipeline construction zone, but it would only last a short time (3 months or less), after which the animals would return. Migration paths could be blocked for a very short time during construction.

An unquantifiable amount of poaching and wanton killing of wildlife along the pipeline right-of-way could also occur during construction. In addition, long-term harassment of wildlife, particularly big game animals, could occur if vehicles were allowed to utilize the pipeline right-of-way as an access road.

Since the booster station would be operated on a 24-hour basis, some extra traffic is anticipated during shift changes. There could be an harassment factor to big game animals in particular, until they became accustomed to regular travel along the access road to the station.

Based upon the discussion in Section 4.2.1 (Water Resources), it is estimated that the Red Creek watershed delivers about 111,000 tons of sediment annually to the Green River (89,000 tons in suspension and 22,000 tons in bed load). It is also calculated that the slurry pipeline construction could contribute about 4 percent more sediment (4,440 tons) to the Green River during the year of construction. However, according to work being done by the Utah Division of Wildlife Resources, that portion of the Green River downstream from Red Creek supports a spawning population of brown trout and is stocked with rainbow and cutthroat trout (Bonebrake 1982). The sediment contributed to the Green River from the Red Creek Watershed apparently does not harm the brown trout spawning beds, except in years of exceptionally high flows. In addition, the brown trout is a fall spawner, and any sediment from construction should be dissipated prior to onset of spawning.

The calculated amount of sediment added to the Green River by pipeline construction in the Red Creek Watershed would not significantly affect the fishery in the Green River. The 4 percent addition to the average sediment load would be within natural deviations from normal sediment levels.

Winter bald eagle habitat could be found along the Green River where the phosphate slurry pipeline would cross the river (about MP 33.5). Construction of the pipeline is planned during the summer months. If Chevron adheres to this schedule, no adverse impacts to the bald eagle are anticipated. The endangered peregrine falcon could range over portions of the proposed action pipeline, but none of the project facilities would be near any known active eyries. Therefore, no adverse impacts are anticipated.

Railroad Spur

The proposed railroad spur would disturb about 159 acres of summer deer range and yearlong pronghorn range for the life of the project. The same amount of general sage grouse range and whitetail prairie dog habitat would be lost over the long term.

An unknown number of small burrowing mammals would be lost for the life of the project on an estimated 159 acres of habitat. However, the high reproductive potential of these species indicate that repopulation would be rapid once reclamation is completed. No adverse impacts are anticipated.

The railroad spur would traverse an area of known raptor concentrations. If railroad construction occurred during the critical March 1 through June 30 nesting period, abandonment of nests and lowered production would result. However, assuming that the general measures described in Appendix 2 are followed, no impacts would occur.

Microwave System

The four microwave sites to be constructed at the mountain top locations would remove approximately 1 acre of wildlife habitat. This amount would not cause any significant impact on any wildlife species. Refer to discussions of individual components of the proposed action for impacts from the other four microwave sites.

County Road Relocation

The relocation of County Road 4-27 would remove approximately 29 acres of summer mule deer and pronghorn range for the life of the project. The same amount of general sage grouse range and whitetail prairie dog range would also be lost for the long term. These habitat losses would not be significant because the total acres that would be lost represent less than 1 percent of the available habitat.

An unknown number of small burrowing rodents would be killed during construction of the road. It is anticipated that initial losses would be less than 1 percent of the regional small mammal population.

Summary

The proposed action would disturb about 1,392.50 acres of mule deer habitat, 408.5 acres of elk range, and 1,237.25 acres of pronghorn range (see Table 4-21 for listings of wildlife habitats disturbed by project component). In addition, about 587.25 acres of sage grouse range and 341 acres of whitetail prairie dog habitat would also be disturbed. Habitat losses are not predicted to cause significant impacts because the total acres that would be lost for any species represent less than 1 percent of the total available habitat.

Indirect impacts caused by human population increases are not expected to be significant because it is estimated that poaching, etc., would increase by no less than 8 percent over present levels which is below the significance criteria of 15 percent. Some wildlife population losses could result from harassment and lowered production; however, none of these losses would be significant. Adverse impacts to aquatic resources within the Green River are not anticipated to be significant since the amount of silt deposited into Red Creek from construction activities is not calculated to reach the Green River under normal flow conditions.

Adverse impacts to aquatic life within the Green River, including the endangered Colorado squawfish and humback chub, are not anticipated to be significant. There are no known spawning areas within 2,000 feet of the river crossing, and sediment levels are not expected to reach the 100 milligram per liter significance level.

4.2.6 Visual Resources

The analysis of impacts which would occur if the proposed action or alternatives were constructed is based upon the BLM Contrast Rating System which is summarized in Appendix 6, Visual Resource Management Methodologies (BLM 1978a). The existing VRM and VQO classifications are shown on Maps A4-10A and A4-10B. The system determines landscape contrasts that would be created by evaluating the extent that the project would visually contrast with the existing landscape in terms of form, line, color, and texture changes. The extent of contrast is then translated into either adverse or beneficial impacts.

VRM class and VQO classifications, along with topographic and other maps, were analyzed to determine potential problem areas and typical viewing points of the proposed action and alternatives. Typical viewpoints are generally from major roadways, rest stops, recreation areas, and rivers which experience high recreation use. Anticipated areas of high contrast and typical viewpoint areas were evaluated for contrasts. The duration of view, number of viewers, angle of observation, ease of revegetation, construction, and restoration methods (Chapter 1) are all considered in analyzing the degree of contrast. In addition, cumulative development was considered where existing projects are located. The contrast evaluation was concerned with only the residual effects of construction activities such as surface scars, removed vegetation, and finished structures. Construction crews and equipment would be visible only temporarily and, therefore, would not have a significant impact on the visual resources of the areas involved.

The proposed action and alternatives would affect the existing landscape by disturbing the topographic landform, removing vegetation, and introducing new structures to the landscape. Each form of change would create either temporary short-term or long-term impacts to the landscape. Changes that would occur during construction and through the first year of the project are considered temporary and, therefore, insignificant. Changes that would occur from 3 to 5 years following construction are considered short term, and changes that would be evident throughout the life of the project and beyond would be considered long term. These two time periods may or may not be considered as significant impacts. Changes to the visual resources of the areas that do not meet the criteria established for the VRM class or VQO in which they occur are considered significant adverse impacts and are described for the proposed action in Table 4-22.

Plant Complex

Specifically, the plant complex would cause a number of adverse impacts to the existing visual resources of the area. Although landform

TABLE 4-22
AREAS OF SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS CAUSED BY THE PROPOSED ACTION

Component and Location	VRM Class and/or VQO	Acres Significantly Affected	Location and Duration of Impacts	Explanation
RED CREEK CANYON PHOSPHATE SLURRY PIPELINE				
MP 31-32 (Segment A)	II	6	Viewed from Green River (long-term)	Contrasts in landform modification and vegetative clearing for pipeline as seen from Green River
MP 33-34 (Segment A)	II	6	0.5 mile each side of Green River (long-term) (Green River crossing)	Contrasts in vegetative clearing for pipeline as viewed from Green River crossing
MP 50-53 (Segment A)	II	18	Seen from U.S. Highway 191 (long-term)	Contrasts in vegetative clearing for pipeline
BOOSTER PUMP STATION	II	4	Facility viewed from U.S. Highway 191 (long-term)	Contrasts in vegetative clearing and addition of a structure (booster pump station)
MP 0-3 (Segment B)	II	18	Viewed from U.S. Highway 191 (long-term)	Contrasts in vegetative clearing for pipeline
MP 5-7 (Segment B)	II	12	Seem from U.S. Highway 191 (long-term) (Red Creek Basin Escarpment)	Contrasts in landform modification and vegetative clearing for pipeline construction across Red Creek Basin Escarpment

TABLE 4-22
AREAS OF SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS CAUSED BY THE PROPOSED ACTION (concluded)

Component and Location	VRM Class and/or VQO	Acres Significantly Affected	Location and Duration of Impacts	Explanation
BOOSTER STATION POWER TRANSMISSION LINE				
MP 0-1	IV	3	Seen from U.S. Highway 191 where power transmission line ties in with supply line at substation (long-term)	Contrasts in addition of wood pole power transmission line supports and conductor
PLANT WATER LINE WITH PUMP STATION AND ACCESS ROAD				
MP 11-12	III	3	Seen from U.S. Highway 191 (long-term)	Contrast in vegetative clearing for pipeline and road
MP 15-16 (end)	R/III	R = 1 III = 2	Viewed from Flaming Gorge NRA and U.S. Highway 191 (long-term)	Contrast in vegetative clearing for facilities including a microwave tower. Contrast in addition of structures of pump station facilities, and power substation if line built above-ground, as seen from NRA, Green River
POWER TRANSMISSION LINE TO PLANT WATER SOURCE				
MP 0-1	R/III	R = 1 III = 2	Viewed from Davis Bottom in NRA (long-term)	Contrast in vegetative clearing
MP 4-5	III	3	Viewed from U.S. Highway 191 (long-term)	Contrast in addition of pole structures and conductor
RAILROAD SPUR (No significant adverse visual resource impacts)				
PLANT COMPLEX WITH POWER AND COUNTY ROAD RELOCATION				
PLANT COMPLEX	IV	1,500	Viewed from State Road 430 South and relocated County Road 4-27 (long-term)	Contrast in landform modification and vegetative clearing for plant site, gypsum impoundment, and other facilities. Contrast in addition of all structures for life of project.
MICROWAVE SYSTEM				
Grizzly Ridge	R	1	Viewed from Utah State Highway 44, recreation sites, and possibly from summer homes (long-term)	Contrast in structure of reflector
Tepee Mountain	IV	1	Viewed from U.S. Highway 191 (long-term)	Contrast in structure of reflector
Booster Pump Station	II	–	Viewed from U.S. Highway 191, Red Creek Basin (long-term)	Tall tower and antenna would cause structural contrast. Acreage total included with station total.
Wilkin's Peak	III	1	Viewed from U.S. Highway 191 (long-term)	Would add to cumulative structural contrast of existing antennas and buildings

NOTE: Refer to Appendix 6, Visual Resource Management Methodologies, for definitions of terms.

modifications and vegetative clearings would create significant contrasts, the primary cause of contrast would be the addition of large scale, permanent structures to an existing landscape presently void of any structures, except for an existing road, fences, and power transmission line. The structures would be large in scale in terms of form, line, color, and texture qualities. Included with the impacts of the plant would be those created by the aboveground power transmission line and microwave system serving the plant. Fences, the access road, and the relocated county road would add to the contrasts imposed on the existing landscape character by the proposed action. The gypsum impoundment would introduce a landform modification, but would appear insignificant in relation to the structural additions. Refer to the Air Quality section for a description of the effects of the plant complex on visibility.

Davis Bottom Plant Process Water Pipeline

The plant process water pipeline intake structure, pump building, fencing, and access road would, to varying degrees, create an adverse contrast with the existing landscape. Since most of these facilities would be located in and viewed from the Flaming Gorge National Recreation Area (NRA), impacts from these structures would be significant.

Red Creek Canyon Phosphate Slurry Pipeline

The phosphate slurry pipeline would create impacts primarily related to vegetative clearings, structural contrasts related to the booster station and associated power source, and, to a lesser extent, modifications to landform.

Microwave System

The microwave system would add antennas to three existing mountaintop communication sites and one at an area already disturbed by a drill pad. Antennas would also be placed at the Davis Bottom pump station and at the booster pump station. Because facilities would be placed at higher elevations, three sites would be seen in visually sensitive areas, adding an adverse geometric structure to the landscape.

County Road Relocation

Visual impacts caused by relocating the county road at the plant site would create minor landform modification and vegetative clearing but would be insignificant compared to plant site impacts.

Summary

In summary, a total of 73 acres would be significantly affected by the proposed action in VRM Class II and Retention classified areas, 9 acres in VRM Class III areas, and 1,504 acres significantly affected in VRM Class IV areas. Significance of impacts is determined by VRM classification system identified in the significance criteria section of Appendix 6.

4.2.7 Conflicts With Land Use Plans

The only component of the proposed action that would conflict with any existing land use plans would be the Red Creek Canyon phosphate slurry pipeline. Implementation of the slurry pipeline would conflict with the BLM Vernal District Management Framework Plan which states that all new pipeline construction should occur within existing right-of-way corridors. Approximately 10 miles of the proposed route would be in conflict with this plan.

The phosphate slurry pipeline would also conflict with the Red Creek Watershed Plan which states that, where possible, new construction (pipelines, roads) should only be located in previously disturbed areas. A total of 8.8 miles of the proposed slurry line location would be in conflict.

4.2.8 Recreation Resources

Plant Complex

The total acreage to be used for the proposed plant complex would be insignificant compared to the total recreation acreage available in Sweetwater County.

Of local concern in the Rock Springs area would be projected population increases, including support personnel and family and friends associated with construction personnel (peak of 3,589 persons in 1984, as indicated in the Socioeconomics section) needed for the proposed fertilizer plant. However, impacts upon the quality of dispersed recreation opportunities and experiences are anticipated to be minimal. The area has a relatively low population density compared to the availability of recreation acreage within the county (Wyoming Recreation Commission 1980). Population increases resulting from construction of the proposed plant would probably cause increased hunting pressure on game herds in the area and a reduction in hunting opportunities. The increased population may increase the incidences of poaching and other game law violations causing a decline in hunting quality and success ratios (Bradley 1976) and temporarily strain the capabilities of game and fish law enforcement during the 1- to 2-year peak construction period. However, following completion of construction, it is anticipated that the remaining permanent work force (386 workers, 1,812 new persons in the Rock Springs area, as indicated in the Socioeconomics section) would have relatively minor effects on hunting quality or hunting success within the area.

Recreational facilities (i.e., campgrounds, boat ramps, trails) located within the Flaming Gorge NRA could receive some increased use during the peak construction phase; however, this impact would be temporary (1 to 2 years) and of relatively little consequence because of the various other recreational opportunities available within the NRA and surrounding area.

Davis Bottom Plant Process Water Pipeline

The Davis Bottom water supply system would cause moderate short-term and long-term impacts to recreation and the quality of the recreation user's experience. Based on the significance criteria, public sensitivity to disturbances in the Davis Bottom area would be high.

An all-weather access road extending to the proposed pump station would generally parallel the MAPCO pipeline to Davis Bottom and could change the present use pattern and user experience. The east side of the Green River in the Davis Bottom area is relatively inaccessible at this time. With all-weather access, the types of users could change from those desiring a more primitive experience to those favoring more group-oriented activities. An increase in hunting pressure due to improved access could diminish the quality of hunting experiences and cause a decline in hunter satisfaction by lowering the hunting success for deer, antelope, and waterfowl.

The pump house and associated water intake structures could diminish the quality of river running experiences at Davis Bottom, especially for those river runners seeking only a primitive and natural experience. It is anticipated that the west bank of the Green River at Davis Bottom would still be used as a river landing area for the river runners. Since the pump house and water intake structures would be located along the east bank, the river runners who launched from Green River, Wyoming, could have their primitive experiences diminished to a certain degree by viewing these project features rather than the traditional, natural river setting. The project features could also serve as a landmark for rafters who are unsure of their land area locations, thereby causing a positive impact.

Red Creek Canyon Phosphate Slurry Pipeline

Implementation of the Red Creek phosphate slurry pipeline route and related components would not cause any major short-term or long-term impacts to either the recreation resource or the quality of the recreation user's experience. However, several temporary, short-term impacts would likely occur due primarily to construction-related activity.

Weekend sightseers using the *Drive Through The Ages* portion of U.S. Highway 191, could experience some traffic delays up to 5 minutes long due to heavy construction equipment along the highway. Visual intrusion from pipeline trenching activity may also offend some sightseers at MP A1.5 where the proposed slurry pipeline would cross under U.S. Highway 191. Following completion of pipeline construction through this sightseeing area (within 2 weeks), no long-term effects are anticipated.

The pipeline crossing at MP A33.5 of the Green River would not cause long-term adverse effects on the quality of river running experiences or upon the potential for Wild and Scenic River designation for this segment of the river. River trenching activity and the laying of the pipeline across the Green River would likely eliminate river running opportunities along this stretch of the river for portions of 3 to 4 days. The associated work pad area and right-of-way would be located within the river corridor being considered for Wild and Scenic River designation and would result in an unnatural visual intrusion upon the quality of the river running experience. However, following implementation of a successful revegetation and rehabilitation program (within 2 to 3 growing seasons), the proposed work area and pipeline right-of-way would be virtually unnoticeable.

Between MP A33.5 and A37, the pipeline would follow the north bank of the Green River within the Brown's Park area. Short-term (4 to 6 weeks) noise impacts from blasting activities and generated dust could affect recreationists visiting the John Jarvie Ranch historical site area and general popularly used dispersed camping sites located along the river.

Between MP A40.5 and A52.4 and from the proposed booster station northward between MP B0 and B9 (Map 1-2), the proposed phosphate slurry pipeline, booster station, and microwave tower (which would be about 50 feet tall and located at the proposed booster station) would be located within the boundary of the Red Creek Watershed Area of Critical Environmental Concern (ACEC).

Construction activity associated with the proposed phosphate slurry pipeline would cause short-term (4 to 6 weeks) noise, dust, and visual intrusions upon the quality of primitive recreation experiences (hiking, backpacking, dispersed camping, hunting) within the ACEC. Through implementation of a successful rehabilitation and revegetation program, visual impacts upon the recreation experience are anticipated to be virtually nonexistent within 2 to 3 growing seasons after completion of pipeline construction activity. However, since the proposed booster station and microwave tower would be permanent structures, and visible within the ACEC, the quality of primitive recreation experiences is expected to be diminished.

Pipeline construction activity occurring north of the proposed booster station between MP A7 and A9 could temporarily close an unmarked automobile pull-out sightseeing vista point along U.S. Highway 191 for approximately 1 to 2 weeks. Following construction of the pipeline, booster station, and microwave tower, sightseers and picnickers stopping at the vista point which overlooks the Red Creek Badlands drainage and the Red Creek Watershed ACEC, would have their experiences diminished to a certain degree (see Visual Resources section).

Illegal use of the proposed phosphate slurry pipeline and power transmission line rights-of-way for off-road vehicle (ORV) activities would pose a problem for local field managers. Previous ORV use of closed utility rights-of-way has caused rehabilitation to be unsuccessful in certain areas, and increased the need for environmental protection of soils and vegetation, and wildlife, cultural, and visual resources.

Summary

Impacts to the recreation resource and to user experiences from construction activity would be diminished temporarily (4 to 6 weeks at any one place). Pipeline construction activity would affect sightseeing experiences along U.S. Highway 191. Float boating activity along the Green River past the proposed pipeline crossing point would be eliminated for portions of 3 to 4 days. Noise and dust generated from construction activity could affect sightseers visiting the John Jarvie Ranch historical site, dispersed camping experiences along the Green River, and primitive recreation experiences within the Red Creek Watershed ACEC. Of greater consequence would be the effect of the booster station and microwave tower upon the quality of vista views from the auto day use turn-out overlooking the Red Creek Watershed ACEC. These structures would also affect recreationists who are seeking primitive recreation opportunities. Hunting pressures are anticipated to increase from a predicted population growth of 3,589 persons during peak construction activity in the Rock Springs area. Hunting success would be lowered causing a general decline in hunter satisfaction. The use of recreation facilities (campgrounds, boat ramps, hiking trails) within the Flaming Gorge NRA would also increase during the project's 1- to 2-year peak construction period. Recreational use of the Davis Bottom area along the Green River could increase due to improved access causing a decline in hunter satisfaction and hunting success. The proposed pump house and associated water intake structure, unnatural to the Green River setting, could diminish the quality of river running experiences at the raft landing area. However, these project features could serve as a land mark for rafters who are unfamiliar with the landing area at Davis Bottom; this would be a positive impact. Impacts to recreation resources are identified by the significance criteria established for public sensitivity. Based on the significance criteria, public sensitivity to disturbances in the Davis Bottom area would be high.

4.2.9 Wilderness

Implementation of the proposed action would not have any significant adverse or positive effects on wilderness. No project-related components would directly cross the boundary of any wilderness unit.

However, construction of the Red Creek phosphate slurry pipeline between MP B7 and B9 north of the proposed booster station, could have some temporary, short-term (4 to 6 weeks) impacts upon the quality of user experiences especially for those individuals seeking primitive and unconfined forms of recreation in the northwest portion of the Red Creek Badlands WSA. Heavy construction equipment and dust caused by pipeline construction activity and noise impacts from possible blasting activities, could be offensive to some users and, thereby, temporarily diminish the quality of their experiences. Nonetheless, these impacts would be short term during pipeline construction activity along 2 miles of the proposed right-of-way.

Because the northwest portion of the WSA is buffered by a dirt road and the proposed pipeline right-of-way would be adjacent to the dirt road, long-term visual impacts would not be considered significant to either the wilderness resource or to the quality of the wilderness user experience. No wilderness area would be adversely affected by air emissions from the plant complex.

Population growth during peak construction (1984) would not adversely affect the solitude or natural characteristics of the wilderness resource base within the area.

In summary, impacts to the wilderness resource base would not be significant as the boundary would not be crossed, and impacts would be short term (4 to 6 weeks). The sights, sounds, and possible dust migration from pipeline construction activity along the northwest boundary of the Red Creek Badlands WSA could temporarily diminish the quality of primitive and unconfined forms of recreation experiences within the WSA.

4.2.10 Cultural Resources

The construction activities of the Chevron phosphate project would cause land disturbance and modification to any cultural resources that occur within the area. Impacts could include destruction or alteration of the resources, displacement of artifacts, alteration of the surrounding environment, and introduction of visual, audible, and atmospheric elements out of character with the present environment. These impacts would cause a loss of scientific and cultural information and a loss of a portion of the resource base for future research. The loss of any information could have a significant impact on efforts to reconstruct the prehistory and history of the region.

The exact impacts to cultural resources from any of the proposed action components or alternatives cannot be determined until the facilities have been located on the ground and intensive cultural resource surveys conducted.

Existing literature was reviewed to determine the number of existing sites that may be affected. A 1-mile wide corridor was used in this determination. The number and types of sites found in the proposed corridors are described in Chapter 3. Since the exact locations of the linear facilities are presently unknown, it is not possible to predict specific impacts on even the known sites. Based on the cultural resource survey and compliance procedures described in Appendix 2, significant cultural resource impacts should not occur.

There would be no direct impact on the John Jarvie Ranch historical site. Some indirect impacts could occur during construction of the proposed phosphate slurry pipeline from increased use. Since a caretaker resides on this site, these impacts should be minimal.

4.2.11 Soils and Vegetation

Project activities which would disturb and affect soils and vegetation include: (1) installation and construction of linear right-of-way facilities, (i.e., pipelines, roads, railroads, and power transmission lines); (2) construction of water impoundments; and (3) construction of plant site facilities and the pump station facility. Construction of the phosphate slurry pipeline would also require contour adjustments in areas where slopes exceeded 15 percent due to the 15 percent maximum slope grade limitation established for phosphate slurry pipeline operation.

Construction activities would result in: (1) direct removal of vegetation; (2) reduced vegetation growth from secondary impacts such as sidecasting of material; (3) topsoil disturbance and removal; (4) soil compaction; (5) alteration of the soil profile along the excavated trench area of the pipelines, sidehill cuts in steep sloping areas and along borrow areas of roads and the railroad spur; and (6) loss of soil and rock due to sidecasting on steep sidehill cuts. This disturbance would affect surface water runoff, wind and water erosion, soil stability, and plant growth.

Where construction has caused land disturbance, accelerated wind and water erosion would occur until erosion control measures are implemented (within 1 year). Also access roads required for maintenance of linear right-of-way facilities could be used for ORV activities, thus creating problems in controlling and minimizing off-road land disturbance. Unsurfaced access roads would be subject to rutting by vehicular traffic during wet soil conditions causing concentrations of runoff that could create gully erosion. The pump station, substation, microwave system, and plant site facilities including water impoundments would remove land from its present use for the life of the project. This land would be reclaimed upon abandonment.

Soil impact potential would be greater in areas with less favorable soil and climatic conditions because the soils are more susceptible to erosion hazards and have lower vegetation potential. Soils and major terrain types have been combined into generalized groups to identify areas with less favorable characteristics and with lower restoration and reclamation potential. Table 4-23 identifies locations and extent of these larger sensitive areas that contain locations that would be more susceptible to impacts resulting from the proposed action activities. These areas would require more intensive construction, stabilization, and restoration measures to minimize soil erosion and other related impacts.

Impacts to soils would be generally insignificant because soil loss and the reduction of its productive capacity is expected to be minimized with implementation of effective erosion control and reclamation procedures as outlined in Appendix 2. Some unquantifiable soil loss resulting from accelerated wind and water erosion would occur until erosion control measures are implemented. However, soil impacts would be significant if applicable erosion control measures were not properly implemented, due to lack of compliance with approved plans and stipulations or if adverse weather conditions (mainly heavy rainstorms) occurred during construction before erosion control measures could be implemented. A few, small, unquantifiable areas (mainly abrupt, steep slopes and small, localized areas with soils containing very unfavorable physical and chemical properties) would be subject to accelerated erosion and require intensive and continuing follow-up erosion control measures.

Sidehill cut construction is a major concern related to soil impacts. This type of construction would be required in order to maintain Chevron's 15 percent slurry pipeline grade limitation. Sidehill cuts on slopes exceeding 30 percent would: (1) create extensive side wall cuts that could cause potential unstable soil and bedrock conditions, depending on the type of rock and soil encountered; (2) cause a loss of large quantities of sidecast materials (soil and bedrock) limiting back filling and grading of the cut area; and (3) make restoration to near preconstruction conditions difficult.

Refer to Appendix 7 for a discussion regarding the evaluation of Chevron's erosion control and reclamation program. It is determined that the outlined erosion control and reclamation program and the concurrence by Chevron to adopt the *"Erosion Control, Revegetation, and Restoration Guidelines for Use on Federal Lands,"* would provide an effective program that would ensure successful erosion control and reclamation of all land disturbance.

Final pipeline alignment would tend to avoid, where possible, the smaller, localized areas of highly erodible slopes and unstable slopes. This would reduce the potential for accelerated erosion and other impacts.

TABLE 4-23
AREAS MOST SUSCEPTIBLE TO IMPACTS FROM PROPOSED ACTION ACTIVITIES

			Sensitive Area Description and Comments			
Project Component	Location by Milepost	Extent Miles (Acres)	Precipitation Less Than 9 Inches	Slopes (15% +)	Unfavorable[2] Soils Properties	Other
Fertilizer Plant[1]		NA (530)	X			Wind Erosion Hazard
Plant Process Water	0-13.3	13.3	X			
Pipeline-Davis	13.3-13.5	0.2	X		X	
Bottom	13.5-16.2	2.7	X			
(MP A0-A16.4)	16.2-16.4	0.2	X	X	X	Saline Soils
TOTAL		16.4 (100)				
Red Creek	1.1-1.4	0.3		X	X	
Phosphate Slurry	1.5-4.8	3.3				Dissected Plateau
Pipeline	4.8-5.2	0.4		X	X	
(MP A0-A52.4)	5.9-6.0	0.1		X	X	
	28.4-29.9	1.5		X		Rye Grass Draw (Map A-4-1)
	33.4-33.6	0.2				Green River Crossing
	39.0-39.1	0.1		X		Dissected Alluvial Fan
	42.1-45.3	3.2			X	Red Creek Canyon (Floodplain) (Map A-4-2)
	47.0-47.1	0.1		X		
	52.2-52.3	0.1		X		
Segment A Total		9.3 (56)				

TABLE 4-23
AREAS MOST SUSCEPTIBLE TO IMPACTS FROM PROPOSED ACTION ACTIVITIES
(concluded)

			Sensitive Area Description and Comments			
Project Component	Location by Milepost	Extent Miles (Acres)	Precipitation Less Than 9 Inches	Slopes (15% +)	Unfavorable[2] Soils Properties	Other
MP B0-B45.8)	.9-1.2	0.3		X		
	5.4-7.2	1.8		X	X	Red Creek Basin Escarpment (Map A-4-3)
	9.3-10.1	0.8		X		
	10.5-11.0	0.5		X	X	
	11.5-12.9	1.4		X	X	
	14.0-14.3	0.3		X		
	23.8-24.2	0.4		X	X	
	25.0-36.5	11.5	X		X	Saline-Alkaline Soils
	36.5-41.8	5.3	X			
	41.8-42.3	0.5	X	X	X	Rock outcrop
	42.3-45.8	3.5	X			
Segment B Total		26.3 (158)				
Railroad Spur[1] (MP A0-A8.7)	0.0-0.7	0.7	X			
	0.7-0.8	0.1	X	X	X	
	0.8-6.4	5.6	X			
	6.4-7.2	0.8	X	X	X	
	7.2-8.7	1.5	X			
TOTAL		8.7 (159)				
Microwave System[1]		NA (1)		X	X	
County Road Relocation[1]	0.0-1.6	1.6				Erosion Hazard
(MP A0-A1.6) TOTAL		1.6 (29)				

NOTES: Table prepared from soils-terrain analysis and orthophotograph interpretations. MP locations are approximate, based on general, preliminary pipeline right-of-way information. NA - Not Applicable.

[1]These project components have no alternatives.

[2]Unfavorable soil property parameters:
- shallow over bedrock
- underlain by hard bedrock
- sandy loam sand and clay textured surface and subsoil layers
- containing more than 35 percent coarse fragments by volume, exceeding sizes of 3 inches in diameter
- permeability less than 0.6 inch per hour
- water table less than 72 inches
- soil reaction with pH value greater than 8.5, salinity more than 16 millimhos in the upper 40 inches.
- occupying slopes steeper than 15 percent.

These soils are most susceptible to impacts and have low reclamation potential.

Five major vegetative types would be affected by the proposed action. A general discussion of types of impact that would occur and length of time required for complete reclamation for each major type follows.

Sagebrush/Grass: This species would be removed to the extent that it would interfere with construction, but would be allowed to revegetate over the entire right-of-way. Regrowth to preconstruction conditions would require 10 to 25 years.

Saltbush/Greasewood: This vegetation would be cleared to facilitate construction activities. Overstory vegetation would require from 20 to 40 years to grow to preconstruction dimensions.

Pinyon-Juniper: Chevron would remove pinyon-juniper vegetation from the width of the right-of-way. Tree growth would require 100 years or more to attain preconstruction dimensions.

Riparian Vegetation: Riparian vegetation is associated with moist or wet areas and would be removed at stream crossings as necessary. Growth would be restored within 3 to 5 years except for brush or tree species which would require from 10 to 25 years to grow to preconstruction dimensions.

Mountain Shrub/Aspen: Chevron's construction procedures would require that all brush and trees within the construction right-of-way be removed. Grasses and forbs would reach their preconstruction densities within 3 to 5 years, while brush and trees would require from 20 to 150 years to achieve preconstruction dimensions.

Long-term impacts would result from removal of vegetation for the life of the project as a result of constructing buildings, roads, ponds or other structures as decribed in Chapter 1.

Plant Complex

A total of 548 acres of land would be disturbed and 531 acres removed for the life of the project due to facility site construction and operation. The 548 acres of land that would be disturbed occur in sensitive soil areas (Table 4-23) that are subject to wind erosion hazard and would be difficult to revegetate because of low annual precipitation. For acreage of vegetation types that would be disturbed and removed from production, refer to Table 4-24.

Fluoride emissions after treatment, from the proposed plant complex would take the form of SiF_4 (silicone tetraflouride), HF (hydrofluoric acid) and H_2SiF_6 (fluorosilicic acid). These substances elevate ambient air and soil-water fluoride concentrations, resulting in increased fluoride concentrations in the leaf tissues of vegetation. An unknown amount of vegetation downwind from the plant complex would be affected to some degree.

Vegetation in the vicinity of superphosphate and elemental phosphorus plants is often injured by fluoride emissions (Gough, et al. 1979). Injury symptoms are leaf-margin necrosis (edge browning) and interveinal chlorosis (yellowing), or both, leading to reduced growth. In addition, if this

TABLE 4-24
ACRES OF VEGETATION TYPES DISTURBED AND OCCUPIED BY PROPOSED ACTION COMPONENTS

Vegetation Type	Plant Complex and Facilities	Davis Bottom Plant Process Water Pipeline and Facilities	Red Creek Canyon Phosphate Slurry Pipeline and Facilities	Railroad Spur	County Road Relocation	Total
Sagebrush/Grass	522 (510)	112 (12)	370.25 (4.25)	146 (142)	29 (29)	1,179.25 (701.25)
Pinyon-Juniper	5 (0)	18 (3)	161.00			184.00 (3)
Greasewood	20 (20)	8 (0)	80.00	8 (8)		116.00 (28)
Riparian Vegetation	1 (1)	2 (1)	16.00	5 (5)		24.00 (7)
Saltbush						
Mountain Shrub/Aspen			12.75 (0.75)			12.75 (7)
TOTAL	548 (531)	140 (16)	640.00 (5.00)	159 (159)	29 (29)	1,516.00 (740)

Source: Diamond Mountain URA, 1977; Brown's Park URA, 1977; Ashley Creek URA, 1979; Salt Wells Oil and Gas EA, 1981.

Note: Acreage figures not in parentheses represent acres disturbed. Acreage figures in parentheses represent acres removed for the life of the project. No agriculture would be affected by implementation of the proposed action and related components.

[1] Acreage figure includes pipeline, booster pump station, power substation, power transmission line and microwave system.

vegetation were used as food for wildlife, livestock, or humans, it may cause fluorosis which is a bone disease (Suttie 1971). Concentrations of fluorine measured in grass species within 2 miles of phosphate processing plants in Idaho ranged from 50 to 220 parts per million and in sagebrush concentrations, ranged from 170 to 1,100 parts per million (Suttie 1971). Until further research is completed, it is possible that injury to plants used as forage by pronghorn and sage grouse on about 1,456 acres (Maps A4-7A and 7B) could occur from emissions produced by the proposed plant.

Davis Bottom Plant Process Water Pipeline

The Davis Bottom pipeline and associated access road, power transmission line, and pump station would disturb 140 acres of land, of which 124 acres would be reclaimed and 16 acres removed for the life of the project. The entire 140 acres would be located in sensitive soil areas (Table 4-23). Implementation of the pipeline and associated facilities would disturb 73 acres of sagebrush/grass, 12 acres of pinyon-juniper, 4 acres of greasewood, and approximately 1 acre of riparian vegetation.

Red Creek Canyon Phosphate Slurry Pipeline

Construction of the Red Creek Canyon pipeline would disturb 617 acres of land, all of which would be reclaimed. The pipeline would disturb 214 acres of sensitive soils (Table 4-23). A total of 370.25 acres of sagebrush/grass, 161 acres of pinyon-juniper, 80 acres of greasewood, 16 acres of riparian vegetation, and 12.75 acres of aspen-mountain brush vegetation types would be disturbed. Understory vegetation would return to preconstruction densities within 5 years following construction; overstory vegetation would require longer periods of time as identified in the general discussion.

Construction of the slurry pipeline would affect the following key issue areas:

- *Rye Grass Draw (Map A4-1)*—Pipeline construction through areas with slopes exceeding 15 percent would require contour alignment adjustments to compensate for the maximum 15 percent grade requirements of the slurry pipeline. This would cause sidehill cuts on the steep adjoining mountain sideslopes, in areas where the width of the draw would not allow for the contour alignment. This would create extensive sidecasting of soil and hard bedrock, reduce vegetative growth on the downslope area from the sidecast material, and make restoration difficult. The upper portion of Rye Grass Draw located approximately between MP A28.4 and A29, would be the most critical for construction in this area.

- *Red Creek Canyon (Map A4-2)*—Pipeline alignment through this area would be in the narrow floodplain and stream course, with the pipeline imbedded in the hard bedrock floor. Construction activities would cause extensive cuts in the floodplain deposit, creating areas of unconsolidated materials that would be subject to erosion and accelerated stream cutting during periods of flash flooding. Some rock fall could occur during construction. To successfully construct and protect the pipeline and to protect the floodplain would require: 1) construction timing; 2) protection of unconsolidated fill materials during construction, and 3) after construction is completed, protection of meander areas disturbed by construction and areas where the pipeline crosses floodplain deposits by riprapping to reduce stream cutting.

- *Red Creek Basin Escarpment (Map A4-3)*—Pipeline construction through this area would require extensive sidehill cuts causing: (a) sidecasting of mainly consolidated soft bedrock (interbedded sandstone and shale) materials where the pipeline crossed the badlands and very steep sideslopes (consists of geologic formation exposures and very limited soil development); (b) potential unstable soil conditions requiring special construction techniques in portions where the alignment crossed narrow concave alluvial/colluvial fill areas and at approximately MP B7.0 to B7.1 where the alignment crossed wet spots; (c) soil loss from sidecasting would be minimal due to the limited soil development along the steep sloping badland and exposure areas. (In smoother sloping areas where deeper soils are forming, sidecasting materials can be stockpiled and replaced in the right-of-way); (d) accelerated geologic or natural erosion especially in the event of adverse weather conditions; and (e) increased sediment yield from the alignment area due to construction and operation activities; this increase would be considered minimal due to the limited watershed area, shape and number of tributary drainages, and the nature of the cut materials (mainly consolidated rock materials that would require weathering).

Railroad Spur

Railroad spur construction would disturb and remove 159 acres of land for the life of the project, of which 25 acres would be within the fenced plant complex. This would include disturbance of 159 acres of sensitive soils (Table 4-23) and 146 acres of sagebrush-grass, 8 acres of greasewood, and 5 acres of riparian vegetation.

Microwave System

The microwave stations would disturb 1 acre of land for the life of the project. The acreage contains a combination of sagebrush-mountain shrub vegetation on the mountaintops and is located in a sensitive soil area (Table 4-23).

County Road Relocation

A total of 29 acres of land would be disturbed and removed from production for the life of the project; 25 acres would be located within the fenced plant complex. The total acreage is located in sensitive soil areas (Table 4-24) containing sagebrush/grass vegetation.

Summary

The proposed action would disturb 1,516 acres of land, of which 740 acres would be occupied. Of the land disturbed, 1,053 acres would occur in sensitive soil areas (Table 4-23).

Additionally, 1,179.25 acres of sagebrush/grass, 184 acres of pinyon-juniper, 16 acres of greasewood, 12.75 acres of aspen-mountain shrub, and 17 acres of riparian vegetation would be disturbed (Table 4-24). The degree of significance is determined by the length of time required for successful restoration and recovery.

4.2.12 Agriculture

All components of the proposed action or alternatives would be in areas where livestock grazing occurs except for those components which would cross the Rye Grass allotment. This allotment has been retired for mitigation purposes.

No cropland would be affected by any of the plant site facilities, pump stations, or facility rights-of-way of the proposed action. Project-related population increases and associated support facilities would not cause any significant impacts to farming from conversion of cropland to other uses in the Rock Springs area.

Plant Complex

A total of 1,500 acres would be fenced at the plant complex and removed from livestock grazing for the life of the project. This would remove 110 animal unit months (AUM's). When combined with the railroad spur, county road, and microwave stations, a total of 150 AUM's would be lost for the life of the project in the Rock Springs allotment which represents 0.003 percent of the total available. The net result of the proposed action or its alternatives would be insignificant to individual livestock operations and the industry in general.

Davis Bottom Plant Process Water Pipeline

The water pipeline would have the same impact per mile as the phosphate slurry pipeline except at the lower elevations. Approximately 5 AUM's of forage would be lost for a period of 2 to 5 years due to construction activities; this would be considered an insignificant impact.

Red Creek Canyon Phosphate Slurry Pipeline

The pipeline, pump station, and associated power transmission line would affect an average of 6 acres of land per mile for a period of 2 to 5 years; this equates to 1 AUM on the higher producing areas to 1/3 AUM per mile on other lands. All allotments and private lands crossed in Utah and Wyoming would have forage production losses of less than 1 percent of the total available for any 1 year. Specifically, vegetation loss could cause forage loss for one cow or five sheep over 5 miles of pipeline along the best rangeland located at higher elevations, and one cow or five sheep every 15 mile-long segment of pipeline over approximately 80 percent of any pipeline route (BLM 1978b; FS 1982). Approximately 33 AUM's of forage would be lost for a period of 2 to 5 years due to construction activities; this would be considered an insignificant impact.

In addition, the following conditions could cause significant secondary impacts.

1. If the pipeline trench were left open for periods longer than 1 week, livestock could be separated from suitable water and forage, thus causing disruption of grazing systems.
2. The pipeline route would clear a path for livestock trailing which could cause livestock distribution problems. However, this could also improve forage conditions through better livestock distribution.
3. Pipeline crews could cause livestock to abandon traditional grazing areas during the construction period because of heavy vehicular traffic, gates left open, or failure to secure temporary gap fences.

Summary

There would be no significant impacts to agriculture from implementation of any component of the proposed action. Since there would be no loss to livestock stocking rates nor any long-term conversion of grazing areas, impacts are considered insignificant.

4.2.13 Ruptures and Spills

No attempt has been made in this analysis to predict where or if a spill may occur. For the purposes of discussion, if a rupture or spill did occur, there are three general areas of probability.

Spills or ruptures in the Green River and spills on flat land and steep sideslopes (40 percent) could constitute impacts to various resources as indicated in the following discussion. There would be no significant or long-term rupture and spill impacts for the following resources: socioeconomics, transportation networks, air quality, land use plans, recreation resources, wildlife, soils and vegetation, and agriculture.

Green River Spill

Water Resources: The worst case spill would involve a pipeline rupture and complete drainage of its contents directly into the Green River. (Refer to Appendix 8 for specific calculations and assumptions.) The spill could deliver 1,009 cubic yards or 2,548 tons of sediment into the river. In addition to this, 396,743 gallons or 1.21 acre-feet of water would be discharged.

Upon rupturing, the coarsest materials in the pipeline would rapidly form a temporary *sand bar* 30 to 60 feet downstream from the spill site consisting of approximately 20 cubic yards of phosphate. It would then erode, and individual particles would bounce or roll along the bottom in a downstream direction.

Another 989 cubic yards of sediment would be transported downstream rather rapidly. Much of it would remain in suspension for several hours; however, it would mix rapidly and be *lost* in the system.

The remaining sediment would either be in a bedload, bouncing and rolling along the bottom, or in a suspended load. Regardless of its mode of transportation, it would rapidly move through the system.

Wildlife: A worst case slurry spill into the Green River would drain slurry from approximately 22 miles of pipeline into the river. Included with the ground phosphate slurry would be two corrosion inhibitors (lime at 1 pound per ton of solids and sodium sulfite at 75 mg.l of water) and a scale inhibitor (Cyquest 3270 at 5 parts per million).

The corrosion inhibitors when added to the slurry mixture would cause the slurry to become alkaline (pH 9 to 10) and low in dissolved oxygen (0 to 0.1 mg/l). The EPA's water quality criteria for fresh water aquatic life is pH 6.5 to 9. No significant impacts to aquatic life are expected from the pH range indicated for the corrosion inhibitors, especially in view of the dilution factor caused by normal flow in the Green River.

According to the EPA (1976), the water quality criteria for fish populations include a minimum concentration of dissolved oxygen of 5 mg/l. The slurry solution is very low in dissolved oxygen, but the dilution factor from the Green River would preclude any adverse impacts to salmonid fish populations below a rupture. Based upon this discussion, in the event of a spill, no adverse impacts would occur to fish populations in the Green River from the chemicals added to the slurry mixture.

A ground phosphate rock slurry spill into the Green River could deposit as much as 1,009 cubic yards of sand-sized or smaller particles of insoluble phosphate rock into the river. However, it is anticipated that there would be no significant adverse impacts to endemic fish or macro-invertebrates from a spill of this type into the Green River.

Visual Resources: Generally, no significant adverse visual resource impacts should occur if a rupture and subsequent spill occurred. However, in worst-case conditions, the visual resource could be adversely affected, although not significantly in most instances. If a spill occurred within the Green River, the spill area could be visible from the river. Since the slurry would soon be diluted by the river, the impacts would be temporary and not considered significant.

Flat Land Spill

Water Resources: The dryland spill on flat land could cause slurry from approximately 5 miles of the pipeline to drain; however, it is assumed that the pipeline would plug with 50 percent of the contents remaining in the pipe. Given these conditions, the spilled slurry would consist of 115 cubic yards or 290 tons of phosphate and 90,173 gallons or 0.27 acre-feet of water. Upon leaving the pipe, the slurry would lose velocity rapidly causing phosphate to settle and accumulate in a mound. As the accumulation increases, velocities would decrease further and water would seep from the mound finding its way to the nearest drainage. Such a spill would cover about 1 acre of land with phosphate or water.

Wildlife: According to calculations obtained from Appendix 8, a rupture in the slurry pipeline would cover approximately 1 acre of flat land if the slurry spread out evenly after the rupture. In this event, the slurry would be deposited in a layer 2/3-inch deep. Most forage plants would not be affected by this amount of deposition. A more likely pattern would be a cone or donut shaped pile of phosphate rock around the rupture that would cover much less than an acre. In this case, some forage plants could be covered and killed, but on such a small area, no adverse impacts to wildlife would be anticipated.

Visual Resources: If a spill occurred on relatively flat land, in shrub or other areas of tall vegetation, the disturbed area would go unnoticed. However, if a spill occurred in an area of low vegetation or in unvegetated areas, the color of the slurry would approximate natural conditions after a few months. In any event, for the spill to be visually sensitive, the viewer would need to be able to look down on the spill area, which is unlikely along the majority of the pipeline alignment.

Steep Sideslope Spill

Water Resources: A spill on a 40 percent slope could cause slurry from approximately 12 miles of pipeline to drain without the pipeline plugging. Under this situation, 826 cubic yards or 2,085 tons of phosphate could be spilled. In addition, 324,608 gallons of water or about 1 acre-foot would be spilled. The slurry would rapidly leave the pipe with the largest phosphate particles settling out. The smaller phosphate particles and most of the water would probably scour the trench where the pipe is buried and then flow at right angles to the slope at the first point where the pipe turns. Such a rupture would have the potential to scour a gully and sufficiently lubricate the surrounding soil so that some type of slumping could be expected. Additional information is given on ruptures and spills in the Chevron Phosphate Project Technical Report (Chevron 1982a) and in Appendix 8.

Wildlife: Based on the calculations identified in Appendix 8, a rupture in the slurry pipeline on a sideslope could discharge an estimated 826 cubic yards of slurry material onto the ground surface. The most likely scenario would be that a gully would be cut by the water and the phosphate rock would quickly settle. No adverse impacts to wildlife are anticipated from a spill of this type because of the small amount of area that would be lost in the gully formation.

Visual Resources: If a spill occurred in an extreme side slope condition, the visual effects would vary depending on the amount of vegetation that is present. If the area were vegetated with large shrubs or trees, the spill most likely would go visually unnoticed. If the area were exposed or lightly vegetated, the area could be seen but the slurry color most likely would blend with natural landscape conditions. Again, only a temporary disturbance would occur in worst cases. Coupled with the probability of such a spill occurring, all cases would indicate only insignificant impacts to the visual resource.

4.2.14 Health and Safety

Plant Complex

Construction hazards within the fertilizer plant would be largely physical, including work-related trauma and exposure to extremes of weather and temperature, noise, and fugitive dust. In addition, construction of the facility would cause a significant increase in traffic, and associated hazards on state, county, and local roads. Additional hazards would exist once the plant becomes operational. These include operational work trauma, effects of emissions on both the work force and general public, potential exposure of the work force and general public to seepage from the gypsum pond, and traffic accidents.

Because of prevailing wind and dispersion patterns, emissions probably would not significantly affect populated off-site areas. Chevron's modeling of air emissions indicates that state and federal primary and secondary ambient air quality standards for sulfur dioxide, nitrogen dioxide, total suspended particulates, and fluoride would not be exceeded. Therefore, Chevron does not expect any significant health effects due to air emissions.

There would be no planned aqueous discharges from the plant, but expected seepages from the gypsum impoundment have not been estimated. The gypsum slurry would be acidic and would contain small amounts of radionuclides and heavy metals.

The general public would be exposed to increased traffic on Wyoming State Highway 430 and on county roads.

The general public would not be exposed to on-site hazards due to complete fencing of the plant facilities. Construction and operation workers of the fertilizer plant would be provided with protection through the rules and regulations of the Occupational Safety and Health Administration which Chevron intends to follow. General safety measures should include engineering controls, administrative controls, and issuance of safety equipment. Engineering controls can greatly reduce health and safety risks. These controls can be many and varied, including use of best available control technology (BACT) for emissions; identification of criteria needed for proper plant design and layout; regular maintenance of equipment, valves, gaskets, etc.; selection of appropriate equipment and materials; adequate ventilation and noise suppression; development of accurate monitoring and leak detection systems; and use of automation where needed to prevent worker exposure to hazards. Administrative controls might include implementation of employee safety awareness programs, use of restricted and controlled access, scheduling regular employee medical check-ups, use of worker rotation and work scheduling to reduce exposure hazards, and instituting training programs and good work practices. Conveniently placed public safety equipment and issuance of personal protective clothing and equipment would also be necessary. An industrial hygiene program should be established to ensure that plant facilities are clean and safe.

Rights-of-Way

Health and safety hazards would exist on the rights-of-way during construction (e.g., pipeline workers should avoid standing in trenches without adequate shoring). After construction and reclamation, the rights-of-way should be relatively free of hazards to the general public.

Not only would traffic-related problems occur as a result of worker traffic to and from the plant, but the shipping and receiving of materials would create additional traffic hazards. These hazards would depend upon the volume of traffic, the nature of materials transported, and the probability of spillage. Efficient clean-up and safety procedures must be available in the event of chemical spills.

Operational hazards would exist with the transportation of molten sulphur, superphosphoric acid, and ammonia fertilizers. Since there would be no at-grade road crossings with the railroad spur, the general public should not be subject to railroad hazards. Workers would be subject to hazards associated with clean-up of spills of molten sulphur, superphosphoric acid, and ammonia fertilizer.

Summary

Construction and operation of the proposed action would primarily affect the project work force. Hazards from construction of the plant complex would include physical impacts to personnel as would pipeline right-of-way techniques. However, Chevron intends to follow the rules and regulations established by the Occupational Health and Safety Administration. Hazards from operation include those associated with transportation of various elements and cleanups in the event of a spill. Seepages from the gypsum impoundment and its possible impact to workers and the public have not been calculated. Air emissions should be dispersed enough to cause little impact to personnel and the public. However, increased traffic, especially along Wyoming State Highway 430, could increase the likelihod for more traffic accidents.

4.2.15 Paleontology

The greatest probability of encountering fossils would be in the Green River Formation and specifically that area extending from the mine to the booster pump station. Because rocks of different ages are crossed in this areas, different depositional environments are encountered and, therefore, more fossils. Impacts to paleontological resources would consist of unquantifiable losses of plant, invertebrate, and vertebrate fossils especially in the area previously mentioned. A number of fossils could be destroyed during construction. Increased collection and removal of known fossils in the region would likely result from increased numbers of people within the area.

4.3 MIDDLE FIREHOLE PLANT PROCESS WATER PIPELINE ALTERNATIVE

Implementation of the Middle Firehole Plant

Process Water Pipeline Alternative would not create any significantly different impacts to water resources, socioeconomics, air quality, transportation networks, cultural resources, or health and safety fromthose identified for the proposed action. No land use plans or cropland would be affected by construction and operation of this alternative.

4.3.1 Wildlife

The Middle Firehole Plant Process Water Pipeline Alternative would disturb about 158 acres of mule deer range for the short term and about 25 acres for the life of the project. About 47 acres of elk range and about 158 acres of pronghorn range would be disturbed for the short term. Eighteen acres of elk range and 25 acres of pronghorn range would be disturbed over the long term. Approximately 34 acres of sage grouse habitat and a similar amount of whitetail prairie dog habitat would be disturbed over the short term; 17 acres of both would be disturbed over the long term. (Table 4-25 itemizes long- and short-term wildlife habitat disturbances by habitat type.)

Impacts to threatened or endangered species would be the same as those detailed in the proposed action section for the Davis Bottom plant process water pipeline.

TABLE 4-25

ACRES OF WILDLIFE HABITAT DISTURBED BY THE MIDDLE FIREHOLE PLANT PROCESS WATER PIPELINE ALTERNATIVE

SPECIES AND TYPE OF HABITAT	TOTAL ACRES
MULE DEER	
Crucial Winter Range	0 (0)
Normal Winter Range	109 (13)
Summer Range	0 (0)
Yearlong Range	49 (12)
ELK	
Normal Winter Range	47 (18)
PRONGHORN	
Crucial Winter Range	0 (0)
Normal Winter Range	122 (24)
Summer Range	0 (0)
Yearlong Range	36 (1)
SAGE GROUSE	
General Distribution Range	34 (17)
WHITETAIL PRAIRIE DOG	
General Distribution Range	34 (17)

NOTE: Acreage figures not enclosed in parentheses represent acres disturbed (short term); acreage figures enclosed in parentheses represent acres removed for the life of the project (long term).

4.3.2 Visual Resources

The Middle Firehole alternative would significantly and adversely affect visual resources as summarized in Table 4-26. The placement of the project in these areas would exceed the allowable levels of contrast for each VRM class or VQO established for specific portions of the area. Refer to the significance criteria section for a description of the criteria used to determine the significance of visual resource impacts which would occur if this alternative pipeline were constructed.

4.3.3 Recreation Resources

The implementation of this alternative would not cause any major short-term or long-term impacts to either the recreation resource or the quality of the recreation user's experience. However, due to all-weather access into the Middle Firehole area, it is anticipated that there would be a slight increase in dispersed recreation use such as upland game hunting activities and ORV use. Power boating activity along the Middle Firehole area of the Green River is expected to remain unchanged even with

TABLE 4-26

AREAS OF SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS CAUSED BY THE MIDDLE FIREHOLE PLANT PROCESS WATER PIPELINE ALTERNATIVE

Component and Location	VRM Class or VQO	Acres Significantly Affected	Location and Duration of Impacts	Explanation
BURIED WATER PIPELINE WITH EXISTING ROAD				
MP 13-14	III IV	5 1	Viewed from U.S. Highway 191 (long-term)	Contrast in vegetation clearing for pipeline construction
MP 19-20	R	7	Viewed from Flaming Gorge NRA and U.S. Highway 191 (long-term)	Intake structure, pump building, and microwave tower would cause structure contrast
POWER TRANSMISSION LINE				
MP 0-20 (End)	R II III IV	1 2 20 10	Viewed from U.S. Highway 191 or viewpoint along U.S. Highway 191 (long-term)	Contrast in vegetative clearing and transmission pole structures.

Refer to Appendix 6, Visual Resource Management Methodologies, for definitions of terms.

construction of a pump house and associated water intake facilities.

4.3.4 Soils and Vegetation

The Middle Firehole alternative would disturb 183 acres of land, of which 158 acres would be reclaimed. The remaining 25 acres would be removed from production for the life of the project. Refer to the proposed action section for discussion of potential impacts to soils and Table 4-27 for location and extent of the larger sensitive areas requiring more intensive construction, stabilization, and restoration measures.

Understory vegetation would return to preconstruction densities within 5 years following construction, while overstory vegetation would require longer periods as detailed in the proposed action section. A total of 81 acres of sagebrush/grass, 25 acres of pinyon-juniper, 75 acres of greasewood, and 2 acres of riparian vegetation types would be disturbed. The 158 acres which would be reclaimed would revegetate through implementation of practices proposed by Chevron and stipulated by the authorized officer. Certain unquantified localized areas and specific locations identified in Table 4-27 would require close supervision and possibly additional measures to achieve satisfactory revegetation. The pump station would remove 1 acre of riparian vegetation for the life of the project.

TABLE 4-27

AREAS MOST SUSCEPTIBLE TO IMPACTS FROM THE MIDDLE FIREHOLE AND JENSEN ALTERNATIVES

			Sensitive Area Description and Comments			
Project Component	Location by Milepost	Extent Miles (Acres)	Precipitation Less Than 9 Inches	Slopes (15% +)	Unfavorable[1] Soils Properties	Other
Middle Firehole Process Water (MP 0.0-20.4)	0-15.1	15.1	X			
	15.1-15.4	0.3	X	X	X	
	15.4-16.0	0.6	X			
	16.0-16.2	0.2	X	X	X	
	16.2-16.4	0.2	X		X	Hard Bedrock
	16.4-16.9	0.5	X	X	X	Escarpment
	16.9-17.1	0.2	X			
	17.1-17.2	0.1	X	X	X	Hard Bedrock
	17.2-20.4	3.2	X			
TOTAL		20.4 (124)				
Jensen Slurry Water Supply (MP 0.0-19.0)	3.0-3.5	0.5		X	X	
	4.4-5.5	1.1		X	X	
	7.8-19.0	11.2	X			
TOTAL		12.8 (78)				

NOTES: Table prepared from soils-terrain analysis and orthophotograph interpretations. Milepost locations are approximate, based on general, preliminary pipeline right-of-way information.

[1]Unfavorable soil property parameters:
- shallow over bedrock
- underlain by hard bedrock
- sandy loam sand and clay textured surface and subsoil layers
- containing more than 35 percent coarse fragments by volume, exceeding sizes of 3 inches in diameter
- permeability less than 0.6 inch per hour
- water table less than 72 inches
- soil reaction with pH value greater than 8.5, salinity more than 16 millimhos in the upper 40 inches.
- occupying slopes steeper than 15 percent.

These soils are most susceptible to impacts and have low reclamation potential.

4.3.5 Agriculture

Six AUM's of forage would be lost for 2 to 5 years from implementation of this alternative. However, this would be considered an insignificant loss on the Rock Springs allotment.

4.4 JENSEN SLURRY WATER SUPPLY ALTERNATIVE

Implementation of the Jensen Slurry Water Supply Alternative would not create any significantly different impacts to socioeconomics or cultural resources from those identified for the proposed action. There would be no conflict with land use plans and no effect to wilderness and transportation from construction or operation of this alternative.

4.4.1 Water Resources

Transportation of approximately 3,000 ac-ft/yr of water *via* the Green River to a withdrawal site near Jensen, Utah, would not cause noticeable changes in flow to the Green River. This would represent about a 4 cubic feet per second change in flow which would be a 0.06 percent change to the average annual flow at Green River, Utah.

4.4.2 Air Quality

The construction of the pipeline would create emissions of both particulate matter and gaseous pollutants. Construction sources would include site preparation activities, right-of-way clearing, vehicle travel over unpaved roads, pipeline burial, and heavy equipment operation. There would be no significant emissions expected from the operation of the pipeline, because electrically powered pump stations would be used and the pipeline right-of-way would be reclaimed.

The Jensen Water Supply Alternative would be 21 miles long and based on a linear interpolation, the emissions from this alternative would be approximately one fourth of those shown in Tables 4-18 and 4-19. There would be no significant impacts to the air quality of the region from construction of the Jensen water supply pipeline.

4.4.3 Wildlife

The Jensen alternative would disturb about 36 acres of winter/yearlong mule-deer range over the short term and about 43 acres of ring-necked pheasant habitat for one growing season. The pump station would remove about 1 acre of pheasant habitat for the life of the project.

Construction of the Jensen alternative water diversion structure in the Green River could result in direct mortality to spawning Colorado squawfish or to juvenile squawfish. The river in the Jensen area is a significant spawning and nursery area for this endangered fish (FWS 1982). While the actual size of the endangered fish species populations are not presently known, any losses should be considered significant. Impacts to the razorback sucker would be the same as those noted for the federally listed species. Since populations of this fish are now low enough to be of concern to Utah, any losses caused by diversion structures would be significant.

4.4.4 Visual Resources

The Jensen Slurry Water Supply Alternative would significantly and adversely affect visual resources as summarized in Table 4-28. Implementation of the project in these areas would exceed the allowable levels of contrast for each VRM class established for specific portions of the area. Refer to the significance criteria section for a description of the criteria used to determine significance of visual resource impacts which would occur if the alternative slurry water line were constructed.

4.4.5 Recreation Resources

Implementation of the Jensen alternative would not cause major short-term or long-term impacts to either the recreation resource or the quality of the

TABLE 4-28
AREAS OF SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS CAUSED BY THE JENSEN SLURRY WATER SUPPLY ALTERNATIVE

Component and Location	VRM Class	Acres Significantly Affected	Location and Duration of Impacts	Explanation
SLURRY WATER SUPPLY LINE WITH POWER				
MP 18-19	II IV	3 1	Viewed from Green River and State Highway 149	Contrast in addition of structures for pump facilities and pole transmission structures

Refer to Appendix 6, Visual Resource Management methodologies, for definitions of terms.

recreation user's experience. However, temporary, short-term impacts from construction activity would probably affect the quality of the sightseeing experience, and the proposed right-of-way would probably be used for ORV activities.

Recreational sightseeing experiences along the *Drive Through The Ages* on U.S. Highway 191 could be affected by some traffic delays lasting up to 5 minutes because of heavy construction equipment along the highway. Pipeline trenching activity adjacent to the highway may also offend some sightseers between MP 1.5 and 3, where the alternative would parallel U.S. Highway 191. Following completion of pipeline construction (within 2 to 4 weeks) and a successful revegetation program, no long-term effects are anticipated because the pipeline would be buried under the highway.

The use of the alternative right-of-way for ORV activities could pose a problem for the local field manager. In several instances, rehabilitation of utility rights-of-way was unsuccessful because of ORV activities along certain portions of existing rights-of-way. This activity increased the need for environmental protection of wildlife, cultural, soil, vegetation, and visual resources. Impacts could occur to these resources if this right-of-way were used for ORV activities.

4.4.6 Soils and Vegetation

The Jensen alternative would disturb 118 acres of land of which 117 acres would be reclaimed. Refer to the proposed action section for discussion of potential impacts to soils and Table 4-27 for location and extent of the larger sensitive areas requiring more intensive construction, stabilization, and restoration measures.

Understory vegetation would return to preconstruction densities following construction, while overstory vegetation would require longer periods of time. A total of 35 acres of sagebrush/grass, 27 acres of pinyon-juniper, 2 acres of riparian vegetation, and 48 acres of saltbush vegetation would be disturbed. The 59 acres which would be reclaimed after construction would revegetate with implementation of practices proposed by Chevron and stipulated by the authorized officer. Certain small localized areas and specific locations identified in Table 4-27 would require close supervision and possibly additional measures to achieve satisfactory revegetation. The pump station would remove 1 acre of riparian vegetation for the life of the project.

4.4.7 Agriculture

Approximately 4 AUM's of forage would be lost for 2 to 10 years from the implementation of this alternative; however, this loss would be considered insignificant. Construction of this alternative pipeline from the Green River to the phosphate mine would disturb 6 acres of irrigated cropland between MP 17.9 and MP 19.0 (along the terrace of the Green River) for one growing season. Impacts to cropland from pipeline construction would be insignificant and short term (1 year) because restoration is expected to be successful with the implementation of the erosion control and reclamation procedures.

4.4.8 Health and Safety

The health and safety aspects of the Jensen Slurry Water Supply Alternative would be similar to those identified for the proposed action, except that there would be an additional 20 miles of pipeline construction. (Refer to the proposed action discussion, Section 4.2.14.)

4.5 BIG SANDY UNIT, COLORADO RIVER WATER QUALITY IMPROVEMENT PROGRAM ALTERNATIVE

As discussed in Chapter 1, preparation of a detailed plan and environmental impact statement for this project is underway by the Bureau of Reclamation. The details of potential impacts from this possible water development project will be discussed in those documents.

Impacts which would be analyzed for the Big Sandy Salinity Control River Unit EIS include:

- Supply of 21,740 ac-ft/yr of water,
- Removal of 78,000 tons of salt annually from the Colorado River system;
- Reduction of salinity at Imperial Dam estimated at 6.7 milligrams per liter;
- Loss of streamside vegetation because of reduced flow;
- Reestablishment of streamside vegetation which has been lost because of the high salt content of the stream;
- Loss of terrestrial and aquatic habitat;
- Impacts to threatened or endangered wildlife species;
- Impacts to cultural resources;
- Socioeconomic impacts.

4.6. PHOSPHATE SLURRY PIPELINE ALTERNATIVES

Implementation of the phosphate slurry pipeline alternatives would not create any significantly different impacts to socioeconomics, cultural resources, health and safety, or air quality from those identified for the proposed action. No wilderness or cropland would be affected by construction and operation of these alternatives. Impacts to water resources would be similar to the proposed action with the exception of the Red Creek Canyon route. Ruptures and spills to Little Bitter Creek and to the Green River would be the same as identified for the proposed action.

Wildlife impacts to sage grouse habitat and whitetail prairie dog habitat, at the Green River crossing, the booster pump station, power transmission line, and power substation would be the same area as noted for the proposed action route. Impacts to threatened or endangered animal species would also be the same.

4.6.1 Transportation Networks

MAPCO

This alternative would be in conflict with the existing MAPCO pipeline at the head of *Rye Grass Draw*, and described for the proposed action.

The road through Jesse Ewing Canyon would be subject to numerous lengthy closures since the new 50-foot width would require drilling and blasting for about 3 miles. Almost all of the excavated rock would have to be removed from the canyon by truck and wasted. It is estimated that for about 1 month, local and recreational traffic would be disrupted since there would be no other easy access into Brown's Park from that area.

Depending on the final alignment through the Jesse Ewing Canyon, construction of the pipeline would possibly enhance the capability of Daggett County to improve the existing county road. This would result from the pipeline construction leveling off some of the steeper grades in the canyon to the required 15 percent grade necessary for pipeline operation. While the pipeline construction would not provide the county with a new road, Chevron could, by working closely with the county, significantly improve the access into Brown's Park.

Blasting could also damage the existing MAPCO pipeline which transports liquid hydrocarbons. This could require extensive measures to protect and monitor the pipeline during and after construction of the new slurry pipeline. Since the canyon is narrow, blasting could be required within 5 feet of the existing line and would be required within 20 feet, which eliminates all protection methods except shutdown of the existing line. This would have a severe impact on the operation of the MAPCO pipeline.

If a rupture should occur, it would result in an explosion and/or fire which would significantly affect air quality and require the shutdown of the pipeline for repairs. An unscheduled shutdown would interrupt the MAPCO pipeline functions and affect the users of the hydrocarbons.

Northwest

Construction activities near Little Hole Campground would increase the traffic flow on the existing road causing some interruptions in its flow.

There is a chance some blasting may be necessary for about 0.25 mile adjacent to the existing Northwest natural gas transportation pipeline near the Little Hole Campground. If blasting is required, protection and monitoring of the pipeline would also be required. Damage to the line could result in an explosion and/or fire causing the pipeline to shutdown for repair. An unscheduled shutdown would significantly affect the Northwest pipeline functions and the users of the gas.

Willow Creek

This alternative would be in conflict with the existing MAPCO pipeline at the head of *Rye Grass Draw*, as would the proposed action and the MAPCO alternative. Construction of the pipeline from MP A39.5 to MP A41 would have the same impacts as described for the Jesse Ewing Canyon section of the MAPCO pipeline. These impacts include interruptions of traffic flow and possible damage and/or shutdown of the MAPCO pipeline. This would result from excess materials (rocks, etc.) tumbling downward from Willow Creek onto the county road and existing pipeline right-of-way. As with the MAPCO alternative, there exists a possibility of the construction of the alternative improving the access into Brown's Park, if Chevron worked closely with Daggett County. Depending of the final alignment through the Willow Creek area, an improved road could possibly result from this coordination.

4.6.2 Wildlife

MAPCO

Impacts to big game habitat from implementation of the MAPCO Phosphate Slurry Pipeline Alternative would be the same as those noted in the proposed action (Red Creek Canyon) section except for magnitude. According to data listed in Table 4-29, this alternative would disturb 501 acres of mule deer habitat over the short term. About 340 acres of winter elk range and about 400 acres of pronghorn range would be disturbed by this alternative.

Northwest

Impacts to big game habitat from implementation of this alternative would be the same as those detailed for the proposed action (Red Creek Canyon) except for magnitude. According to Table 4-29, about 475 acres of mule deer habitat would be affected over the short term by this alternative. About 345 acres of winter elk range would be disturbed. About 356 acres of pronghorn range would be disturbed (short term) by implementing this alternative.

Willow Creek

The Willow Creek alternative would disturb the same amount and kind of mule deer habitat as the Red Creek Canyon phosphate slurry pipeline (501 acres). It also would disturb about 331 acres of winter elk range. For the short term, this alternative would disturb about 400 acres of crucial pronghorn winter range (Table 4-29).

4.6.3 Visual Resources

Refer to Visual Resources significance criteria for a description of the criteria used to determine the significance of visual resource impacts which would occur if the following alternative slurry pipelines were constructed. The phosphate slurry pipeline alternatives would significantly and

TABLE 4-29
ACRES OF WILDLIFE HABITAT DISTURBED BY PHOSPHATE SLURRY PIPELINE ALTERNATIVES

Species and Type of Habitat	MAPCO		Northwest		Willow Creek	
MULE DEER						
Crucial Winter Range	209	(4.25)	183	(4.25)	209	(4.25)
Normal Winter Range	211	(0.75)	211	(0.75)	211	(0.75)
Summer Range	81	(1)	81	(0)	81	(0)
Yearlong Range	0	(0.50)	0	(0.50)	0	(0.50)
ELK						
Normal Winter Range	340	(4.50)	345	(4.50)	331	(4.50)
PRONGHORN						
Crucial Winter Range	115	(3)	77	(3)	115	(3)
Normal Winter Range	142	(0)	142	(0)	142	(0)
Summer Range	119	(0)	119	(0)	119	(0)
Yearlong Range	24	(1.25)	24	(1.25)	24	(1.25)
SAGE GROUSE						
General Distribution Range	375	(0.25)	375	(0.25)	375	(0.25)
WHITETAIL PRAIRIE DOG						
General Distribution Range	119	(0)	119	(0)	119	(0)

adversely affect visual resources as summarized in Table 4-30. The placement of the project in these areas would exceed the allowable levels of contrast for each VRM class established for specific portions of the area.

4.6.4 Conflicts With Land Use Plans

The Northwest alternative would conflict with the Flaming Gorge NRA Management Plan direction for about 3 miles as stated for Management Unit GR-3 (Chapter 3, Northwest alternative) as follows:

- Would conflict with management decisions c(2) and c(5).
- Would be inconsistent with management direction to

TABLE 4-30
AREAS OF SIGNIFICANT ADVERSE VISUAL RESOURCE IMPACTS CAUSED BY THE PHOSPHATE SLURRY PIPELINE ALTERNATIVES

Component and Location	VRM Class	Acres Significantly Affected	Location and Duration of Impacts	Explanation
MAPCO PHOSPHATE SLURRY PIPELINE				
MP A31-A32	II	6	Viewed from Green River (long-term)	Contrasts in landform modification and vegetative clearing for pipeline as seen from Green River
MP A33-A34	II	6	0.5 mile each side of Green River (long-term) (Green River crossing)	Contrasts in vegetative clearing for pipeline as viewed from Green River crossing
MP A48-A51	II	12	Seen from U.S. Highway 191 (long-term)	Contrasts in vegetative clearing for pipeline
NORTHWEST PHOSPHATE SLURRY PIPELINE				
MP A26-A30	R	24	Viewed from Green River and National Recreation Area recreation sites and roads (long-term) (Goslin Mountain area)	Contrasts in landform modification and vegetative clearing for pipeline construction as seen from Green River and NRA facilities
MP A40-A42	II	12	Seen from U.S. Highway 191 (long-term)	Contrasts in vegetative clearing for pipeline
WILLOW CREEK PHOSPHATE SLURRY PIPELINE				
MP A31-A32	II	6	Viewed from Green River (long-term)	Contrasts in landform modification and vegetative clearing for pipeline as seen from Green River
MP A33-A34	II	6	0.5 mile each side of Green River (long-term)	Contrasts in vegetative clearing for pipeline as viewed from Green River crossing
MP A39-A40		6	Seen from residential areas south of the Green River	Contrast in vegetative clearing for pipeline as it enters Jesse Ewing Canyon as seen from residential areas
MP A48-A51	II	12	Seen from U.S. Highway 191 (long-term)	Contrasts in vegetative clearing for pipeline

Refer to Appendix 6, Visual Resource Management Methodologies, for definitions of terms.

*The booster pump station and power transmission line analysis would be the same for all three alternatives. Refer to Table 4-22 for the proposed action (Segment B).

protect wildlife populations on Goslin Mountain. This area is recognized as a key wildlife area; practically every species of wildlife indigenous to the NRA is represented in this area.

- Would reduce the quality of recreation experiences at Little Hole and Dripping Springs developed sites.

- Could be incompatible with the existing Ashley National Forest Travel Plan (FS 1982) which closes Little Hole Road during winter months to protect road surface and wildlife along Green River corridor.

This alternative would also conflict with the BLM Management Framework Plan which restricts location of new pipelines. Approximately 5 miles would be in conflict.

Approximately 4 miles of the Willow Creek alternative would conflict with the BLM Management Framework Plan which restricts location of new pipelines.

4.6.5 Recreation Resources

MAPCO

The impacts on recreation from implementation of this alternative would be similar to those described for the proposed action.

Northwest

The Northwest alternative would cross the Flaming Gorge NRA causing direct, significant adverse impacts and considerable public controversy. This portion of the NRA has been recognized in the Flaming Gorge NRA Management Plan (1977) primarily for recreation pursuits and for unique wildlife and visual resource values (refer to conflicts with land use plans section).

Although the alternative would cross the Green River at MP A27 (Little Hole), it would not cause long-term adverse effects on the quality of river running and fishing experiences, nor upon the potential for Wild and Scenic River designation for this segment of the river. River trenching activity and the laying of the pipeline across the Green River would probably eliminate river running and fishing opportunities at the Little Hole area for portions of 3 to 4 days.

The associated work pad area and right-of-way within and beyond the river corridor being considered for Wild and Scenic River designation would result in an unnatural, temporary visual intrusion upon the quality of river running and fishing experiences until the corridor is reestablished and successfully revegetated. Additionally, the Forest Service plans to develop the current Little Hole day-use area into a 60-unit campground as well as pave the existing boat ramp. Pipeline construction activity (if it occurred after construction of the campground) would diminish the quality of the camping experience due to noise impacts from blasting and construction activity on Goslin Mountain, dust from heavy construction equipment, and visual and aesthetic intrusions along the right-of-way. Pipeline construction activity would also cause public health and safety concerns.

During pipeline construction along the Green River and between MP A27.2 and A28.5 along the Little Hole Road, recreational opportunities for day-use activities (i.e., fishing, float boating staging areas) would be significantly diminished. Additionally, construction equipment and vehicles would disrupt some recreational traffic and could cause re-routing of traffic.

The alternative would pass within 1/8 mile of the Dripping Springs Campground (also located within the NRA) at MP A29. Impacts to camping experiences and public health and safety concerns would be the same as those identified for Little Hole.

Of long-term consequences within the NRA would be the control of ORV use and the visual intrusion of the right-of-way. The pipeline right-of-way would probably be used illegally for ORV activities, further aggravating an existing problem for the Forest Service supervisor. (The Ashley National Forest Travel Plan (FS 1982a) has closed the existing Northwest pipeline route from ORV use.) Using this right-of-way for ORV activities could also provide new access routes into the NRA, increase the need for environmental protection especially for wildlife values, and hamper restabilization and rehabilitation efforts. Additionally, recreationists viewing the NRA from the Red Canyon Visitor Center would find the alternative pipeline route visually displeasing and unnatural until rehabilitation efforts were completed (2 to 3 growing seasons). However, rehabilitation efforts may not be completely successful due to the predicted difficulty in restricting ORV use along the proposed pipeline right-of-way.

Dispersed recreation opportunities and experiences, especially hunting quality in the Goslin Mountain area, would be temporarily affected due to pipeline construction. Wildlife may become scared from blasting activity, therefore, affecting hunting success for antelope, deer, and elk during the fall months.

Impacts to recreation from the pipeline between MP A34.5 and A42.3; the proposed booster station northward between MP B0 and B9.5, the Red Creek Watershed ACEC (Map 1-2); and other project components including the proposed phosphate fertilizer plant, would be similar to those identified for the proposed action.

Willow Creek

Implementation of this alternative route would affect one less dispered recreation site than the proposed action. Otherwise, impacts from this alternative would be similar to those described in the proposed action section.

4.6.6 Soils and Vegetation

Soil impact potential from implementation of these alternatives would be similar to those identified for the proposed action since the alternative pipelines would generally traverse similar conditions. The differences in the occurrence and extent of sensitive areas is identified by alternative. Table 4-31 identifies the location and extent of the larger sensitive soil areas requiring more intensive construction, stabilization, and restoration measures.

MAPCO

The MAPCO alternative would disturb 624 acres of land, of which 619 acres would be reclaimed. This alternative would cross three key issue areas: *Rye Grass Draw, Jesse Ewing Canyon, and Red Creek Basin Escarpment.* (Refer to proposed action section for discussion of Rye Grass Draw and Red Creek Basin Escarpment.)

Pipeline construction in *Jesse Ewing Canyon* (Map A4-4) would occur in the narrow floodplain. Areas with slopes greater than 15 percent would require contour alignment adjustments, causing extensive sidehill cuts in the steep and very steep, hard bedrock sideslopes. Since the narrow canyon area currently contains a county road and the existing MAPCO pipeline, extreme care would be required to avoid impacts to these facilities and would restrict the alternative slurry pipeline alignment. Extensive amounts of hard bedrock would require blasting and removal to facilitate location of the pipeline.

Understory vegetation would return to preconstruction densities within 5 years following construction, while overstory vegetation would require longer periods of time. A total of 380.25 acres of sagebrush/grass, 133 acres of pinyon-juniper, 88 acres of greasewood, 10 acres of riparian vegetation, and 12.75 acres of aspen-mountain shrub would be disturbed (Table 4-31).

The 619 acres to be reclaimed would revegetate with implementation of the practices proposed by

TABLE 4-31
AREAS MOST SUSCEPTIBLE TO IMPACTS FROM THE PHOSPHATE SLURRY PIPELINE ALTERNATIVES

			Sensitive Area Description and Comments			
Project Component	Location by Milepost	Extent Miles (Acres)	Precipitation Less Than 9 Inches	Slopes Greater Than (15% +)	Unfavorable[1] Soils Properties	Other
MAPCO Segment A (MP 0.0-49.3)	1.1-1.4	0.3		X	X	
	1.5-4.8	3.3				Dissected Plateau
	4.8-5.2	0.4		X	X	
	5.9-6.0	0.1		X	X	
	28.4-29.9	1.5		X	X	Rye Grass Draw (Map A4-1)
	33.4-33.6	0.2	2		X	Green River Crossing
	38.1-40.5	2.4			X	Jesse Ewing Canyon (Map A4-4)
	42.1-42.2	0.1		X	X	
	44.9-45.1	0.2		X	X	
	47.4-47.7	0.3			X	Richard's Gap (Stream Course)
	49.0-49.1	0.1		X		
Segment A Total		8.9 (53)				
(For Segment B Refer to Proposed Action)						
Northwest Segment A (MP 0.0-40.9)	1.1-1.4	0.3		X	X	
	1.5-4.8	3.3				Dissected Plateau
	4.8-5.2	0.4		X	X	
	5.9-6.0	0.1		X	X	
	10.9-11.1	1.2		X	X	
	11.8-11.9	0.1	2	X	X	
	22.9-23.2	0.3		X	X	
	25.5-26.5	1.0		X	X	
	26.9-27.1	0.2			X	Green River Crossing
	27.1-29.8	2.7		X	X	Hard Bedrock (Goslin (Mountain; Map A4-5)
	30.0-30.1	0.1		X	X	Hard Bedrock (Goslin (Mountain)
	31.2-32.7	1.5		X	X	Goslin Mountain
	34.4-35.3	0.9		X	X	High Erosion Hazard (Goslin Mountain), (Map A4-5)
	37.8-38.1	0.3		X	X	
	38.6-38.9	0.3		X	X	High Erosion Hazard
	39.8-41.1	1.3		X	X	
Segment A Total		14.0 (84)				
(For Segment B Refer to Proposed Action)						

TABLE 4-31
AREAS MOST SUSCEPTIBLE TO IMPACTS FROM THE PHOSPHATE SLURRY PIPELINE ALTERNATIVES (concluded)

			Sensitive Area Description and Comments			
Project Component	Location by Milepost	Extent Miles (Acres)	Precipitation Less Than 9 Inches	Slopes Greater Than (15% +)	Unfavorable[1] Soils Properties	Other
Willow Creek	1.1-1.4	0.3		X	X	
Segment A	1.5-4.8	3.3				Dissected Plateau
(MP 0.0-49.8)	4.8-5.2	0.4		X	X	
	5.9-6.0	0.1		X	X	
	28.4-29.9	1.5		X	X	Rye Grass Draw (Map A4-1)
	33.4-33.6	0.2	2		X	Green River Crossing
	36.9-39.8	1.9		X	X	Steep Hard Bedrock (Willow Creek sidehill; Map A4-6)
	39.8-41.1	1.3		X	X	Jesse Ewing Canyon Map A4-4)
	42.6-42.7	0.1		X	X	
	45.4-45.6	0.2		X	X	
	47.9-48.2	0.3			X	Richard's Gap (Stream Course)
	49.5-49.6	0.1		X		
Segment A Total		9.7 (58)				
(For Segment B Refer to Proposed Action						

NOTES: Table prepared from soils-terrain analysis and orthophotograph interpretations. Milepost locations are approximate, based on general, preliminary pipeline right-of-way information.

[1]Parameters for determining unfavorable soil properties are:
- shallow over bedrock
- underlain by hard bedrock
- sandy loam sand and clay textured surface and subsoil layers
- containing more than 35 percent coarse fragments by volume, exceeding sizes of 3 inches in diameter
- permeability less than 0.6 inch per hour
- water table less than 72 inches
- soil reaction with pH value greater than 8.5, salinity more than 16 millimhos in the upper 40 inches.
- occupying slopes steeper than 15 percent.

These soils are most susceptible to impacts and have low reclamation potential.

[2]Areas are in annual precipitation zones greater than 9 inches.

Chevron and stipulated by the authorized officer. Certain small localized areas and specific locations listed in Table 4-32 would require close supervision and possibly additional measures to achieve satisfactory revegetation.

Northwest

The Northwest alternative would disturb 580 acres of land of which 575 acres would be reclaimed. This alternative would cross two key issue areas: *Goslin Mountain, and Red Creek Basin Escarpment*. (Refer to proposed action section for discussion of the Red Creek Basin Escarpment and Table 4-32 for location and extent of sensitive areas requiring more intensive construction, stabilization, and restoration measures.)

Pipeline construction through *Goslin Mountain* (Map A4-5) would require extensive sidehill cuts in the steep rocky sideslope portions underlain by hard bedrock (MP 27.1 to 29.5 and MP 30.0 to 30.1). This would create extensive sidecasting of soil and

TABLE 4-32
ACRES OF VEGETATION TYPES DISTURBED AND OCCUPIED BY PHOSPHATE SLURRY PIPELINE ALTERNATIVES

Vegetation Type	MAPCO		Northwest		Willow Creek	
Sagebrush/Grass	380.25	(4.25)	344.25	(4.25)	371.25	(4.25)
Pinyon-Juniper	133.00		143.00		145.00	
Greasewood	88.00		60.00		88.00	
Riparian Vegetation	10.00		17.00		10.00	
Saltbush						
Mountain Shrub/Aspen	12.75	(0.75)	15.75	(0.75)	12.75	(0.75)
TOTAL	624.00	(5.00)	580.00	(5.00)	627.00	(5.00)

Source: Diamond Mountain URA, 1977; Brown's Park URA, 1977; Ashley Creek URA, 1979; Salt Wells Oil and Gas EA, 1981.
NOTE: Acreage figures not identified in parentheses represent acres disturbed; acreage figures identified in parentheses represent acres occupied for the life of the project. No agriculture would be affected by implementation of these alternatives. Acreage figures include pipeline, booster pump station, power station, power transmission line, and microwave system.

hard bedrock materials, reducing vegetation growth in the downslope area from sidecast material and making restoration very difficult. Lands disturbed by pipeline construction activities through the northern portion of this area (MP 31.2 and 32.7) would require intensive water erosion control measures to reduce soil erosion and provide for successful revegetation.

Understory vegetation would return to preconstruction densities within 5 years following construction, while overstory vegetation would require longer periods of time. A total of 344.25 acres of sagebrush/grass, 143 acres of pinyon-juniper, 60 acres of greasewood, 17 acres of riparian vegetation, and 15.75 acres aspen/mountain shrub would be disturbed (Table 4-32).

The 575 acres that would be reclaimed would be revegetated with implementation of practices proposed by Chevron and stipulated by the authorized officer. Certain small localized areas and specific locations listed in Table 4-32 would require close supervision and possible additional measures to achieve satisfactory revegetation.

Willow Creek

The Willow Creek alternative would disturb 627 acres of land, of which 622 acres would be reclaimed. This alternative would cross three key issue areas and a portion of a fourth: **Rye Grass Draw, Willow Creek, Red Creek Escarpment**, and the north portion of *Jesse Ewing Canyon*. Refer to the proposed action section for discussion of Rye Grass Draw and Red Creek Basin Escarpment and to the MAPCO Alternative for discussion on Jesse Ewing Canyon. Table 4-32 lists the location and extent of sensitive areas requiring more intensive construction, stabilization, and restoration measures.

The pipeline alignment for *Willow Creek* (Map A4-6) would be located mainly on sidehill cuts in the steep and very steep rocky sideslopes. Pipeline construction would cause very extensive sidehill cuts of which portions are hard bedrock. This would cause extensive sidecasting of mainly hard bedrock material, reducing vegetative growth on the downslope area, and making restoration to near preconstruction conditions very difficult.

Understory vegetation would return to preconstruction densities following construction, while overstory vegetation would require longer periods of time. A total of 371.25 acres of sagebrush-grass, 145 acres of pinyon-juniper, 88 acres of greasewood, 10 acres of riparian vegetation, and 12.75 acres aspen-mountain shrub would be disturbed (Table 4-32). The 626 acres to be reclaimed would revegetate with implementation of practices proposed by Chevron and stipulated by the authorized officer. Certain small localized areas and specific locations identified in Table 4-32 would require close supervision and possible additional measures to achieve satisfactory revegetation.

4.6.7 Agriculture

Implementation of this alternative would cause a loss of forage for a period of 2 to 5 years resulting in the following impacts:

- MAPCO - 31 AUM's
- Northwest - 29 AUM's
- Willow Creek - 31 AUM's

All of these losses would be considered insignificant (Table 3-19).

4.7 NO-ACTION ALTERNATIVE

If the No-Action Alternative were implemented, requests for federal rights-of- way would be denied, thus prohibiting development of the project. Although the impacts to resources associated with the proposed action would not occur, the purpose of the proposed project (Chapter 1) would not be achieved. In addition, a financial impact of unknown amount would occur to Chevron Chemical Company.

4.8 MITIGATION NOT INCLUDED IN PROPOSED ACTION AND MONITORING

The following mitigation measures were identified during the process of impact analysis to further alleviate or minimize potential environmental effects from the proposed developments. The federal agencies are committed to these measures and the measures will become stipulations attached to any right-of-way grants that may be issued. These measures apply to the proposed action and alternatives as appropriate, and are in addition to the standard measures identified in Appendix 2.

4.8.1 Mitigation

Chevron will be required:

- to temporarily deter the sediment that could result from construction on the Red Creek Basin Escarpment and to allow for stabilization, two check dams will be built on the major drainages coming from the escarpment. They will have a capacity of 1 to 2 acre-feet each.

- to eliminate the possibility of sloughing and resulting sediment from the wet areas on the Red Creek Basin Escarpment, horizontal drains will be installed. They will outlet on the surface onto a riprap apron.

- to control sediment resulting from construction in Red Creek Canyon, a sediment trap will be constructed at the mouth of the canyon (in section 8, below MP 42). It will have up to 5 acre-feet of storage including 30,000 tons of sediment and be designed to divert the stream into it. The sediment trap will be maintained and cleaned when full for a period of 2 years after construction of the pipeline through the canyon. The materials will be disposed of in an approved site.

- to ensure that at all points where construction in the canyon would cross the stream, whether in the stream channel, or entering or exiting alluvial materials, riprap consisting of human size or larger rock would be placed on the stream bed and the banks to the high water mark. Such riprap would be maintained in a stable and protective manner.

- to surface (gravel) all permanent roads that will be used on a continuous basis during operation of the project. This will minimize rutting and erosion during wet periods.

- to develop a mitigation strategy that should mitigate the socioeconomic impacts that have been identified.

- to provide maximum protection to any river or stream that would be crossed by the slurry pipeline, pipeline valves should be installed on both sides of the stream, or the best possible pipeline rupture prevention technology should be used.

- to develop mitigation measures in coordination with the Wyoming Game and Fish Department and the U.S. Fish and Wildlife Service to prevent bird losses in the gypsum pond. Prevention of losses of migratory birds is mandated by the Migratory Bird Treaty Act.

- to oil or water all non-hard surfaced roads during construction and during the primary recreation seasons from May through September to keep visibility impacts from dust to a minimum.

- to minimize road cuts and fills when constructing new roads or upgrading existing areas to minimize the contrast in landform modification and contrast for the visual resource.

- to double cut ends of culverts to match the road cut slopes, or to use preformed end sections when installing culverts for roads in visually high or medium sensitive areas in order to reduce the visual contrast caused by the addition of a structure to the landscape.

- to use self-weathering steel for guard rails in areas of high or medium visual sensitivity in order to reduce the visual contrast caused by the addition of the structures to the landscape.

- to use long spans at right angles to cross rivers and roads which must be unavoidably crossed in high or medium visually sensitive areas in order to minimize the visual contrasts to form, line, and color from the added structures and conductors.

- to bury the power transmission line for the Davis Bottom water pipeline slurry system from MP 14 to the NRA boundary.

- to bury the power transmission line for the Middle Firehole Water Supply System from MP 17 to the NRA boundary.

- to blend pipeline clearings with natural vegetative clearings and patterns so that they are natural in appearance, or to place pipelines along existing side roads to minimize visual contrast with the natural landscape (i.e., Red Creek Canyon area).

- to use proper trenching and backfill techniques to replace soils (in areas where subsoil colors are different from surface soil colors or where visual sensitivity is high or medium) so color contrasts do not result in lessening the visual quality of an area.

- to develop a technically feasible alternative to eliminate the microwave tower at Davis Bottom or Middle Firehole pump station, depending on which one is authorized, in order to reduce the visual impact.

- to locate the slurry pipeline as close as possible to existing pipelines as determined by the authorized officer in order to reduce the width required for the corridor.

4.8.2 Monitoring

A monitoring program has been agreed upon which is designed to detect significant (10 percent or greater) increases in demand as a result of the Chevron project. Should significant impacts occur, Chevron will work out solutions to the problem with the applicable jurisdiction. The monitoring program will be conducted in cooperation with the Sweetwater County Association of Governments and the Rock Springs planning office. The proposed mitigation and monitoring programs are included in the Chevron Phosphate Project Industrial Siting Council permit application. (Chevron 1982b).

Chevron has agreed to establish a monitoring program in cooperation with the Wyoming Game and Fish Department and BLM for wind-borne fluorides and the potential effects of this element on wildlife, vegetation, and habitats.

4.9 UNAVOIDABLE ADVERSE IMPACTS

The following discussion involves the extent to which the proposed action or alternatives compromise the short-term commitments of resources with the long-term maintenance and availability of these resources. There are no unavoidable adverse impacts for the socioeconomics. All other resources are identified.

4.9.1 Water Resources

The withdrawal and use of 22,500 ac-ft/yr of water from the Fontenelle Reservoir would decrease flows in the Green River and at other downstream points. This would be a permanent but minor adverse impact. Additionally, this consumptive water use would cause a 1 mg/l increase in salinity at Imperial Dam. Some sediment would be produced from crossing the Green River, but this would be a short-term impact. In addition, an unquantifiable amount of sediment would be produced during the construction of the project; however, with the implementation of the mitigation measure outlined in Section 4-8, there would be no impacts.

4.9.2 Transportation Networks

No unavoidable adverse impacts are projected in the area of transportation from implementation of the proposed action. However, the MAPCO alternative, and to a lesser extent the Willow Creek alternative, would have a short-term impact on the road and existing MAPCO pipelines located in Jesse Ewing Canyon. Construction would close the road, and possibly interrupt the flow in the MAPCO pipeline for varying periods during an approximate 2-month construction period.

The Northwest alternative would have short-term impacts on the Little Hole Campground road and existing Northwest pipeline near the Little Hole Campground. Temporary closures of the road and pipeline are anticipated.

4.9.3 Air Quality

The operation of the proposed fertilizer plant would consume a portion of the allowable increments of air quality deterioration under PSD regulations. Also, the plant would use a portion of the clean air resource, pushing the air quality of the impact area closer to the Wyoming ambient air quality standards. This consumption of the clean air resource would continue for the life of the plant.

4.9.4 Wildlife

The proposed action would result in an unquantifiable number of small burrowing rodents and ground-nesting birds being killed by construction activities on about 1,516 acres. Because of the high reproductive potential of these species, repopulation would be rapid once reclamation was completed. Short-term (3 to 5 years) losses of wildlife would occur on about 776 acres and losses of habitat over the life of the project would occur on about 740 acres.

Depending on the combination of alternatives, the minimum acreage of wildlife habitat that would be disturbed is 1,456 acres (Northwest alternative instead of Red Creek Canyon route). This would result in a short-term loss of 716 acres and a long-term loss (life of project) of 740 acres. The maximum acreage of wildlife habitat that would be disturbed is 1,766 acres (includes use of Middle Firehole and Jensen alternatives). This would result in a short-term, loss of 927 acres and a long-term loss of 740 acres.

About 3 acres of riparian vegetation would be disturbed over the short term at the Green River crossing site. In addition, the effects of construction in the river channel itself would cause a temporary short-term loss of about 111 square yards of benthic substrate (river bottom) for each 10 feet of river crossed.

4.9.5 Visual Resources

Proposed Action

Construction, operation, and maintenance of the proposed action would cause unavoidable adverse visual resource impacts in 15 separate areas of the project. These areas include:

Red Creek Canyon pipeline—
- MP A31 through A32, coming out of Rye Grass Draw
- MP A33 through A34, at the Green River Crossing
- MP A50 through A53, between Richard's Gap and the booster station
- MP BO through B3, upon leaving the booster station in the Red Creek Basin
- MP B5 through B7, across the Red Creek Basin Escarpment

The other 10 areas are identified in Table 4-22.

Additionally, the booster station power transmission line would be evident for a mile where it would also be visible from U.S. Highway 191. The process water supply system would be seen for a mile from U.S. Highway 191 and the pump facilities would be seen for up to a mile from the Flaming Gorge NRA. The power transmission line would significantly affect approximately 2 miles viewed from the NRA and U.S. Highway 191.

The plant site would significantly affect over 1,500 acres as viewed from State Road 430 south and relocated County Road 4-27. A number of the microwave stations would create impacts on about 1 acre. Many of the identified areas of impact are located in highly-valued scenic areas and are visible from roadways and recreation areas such as the Green River and the Flaming Gorge NRA (see Visual Resources, Section 4.2.6) The identified areas would remain as impacts even though rehabilitation would occur as described in Chapter 1. Because there is little precipitation, vegetative contrasts would remain for many years. Additionally, the impacts created from construction of permanent structures on the landscape would remain throughout the life of the project and until they are demolished and the sites restored.

Middle Firehole

The Middle Firehole alternative process water supply pipeline would have impacts as identified for the proposed action in this discussion. However, the power transmission line would significantly affect about 20 miles viewed from the NRA and U.S. Highway 191.

Jensen

The Jensen alternative water line would significantly affect about 1 mile, viewed from the Green River and State Highway 149.

MAPCO

If the MAPCO alternative were selected along with the other proposed action components, it would cause unavoidable adverse visual resource impacts in 15 separate areas of the project.

- MP A31 through A32, exit from Rye Grass Draw
- MP A33 through A34, Green River crossing

MP A48 through A51, area between Richard's gap and the booster station.

The other 12 areas would be the same as identified for the proposed action (Table 4-22).

Northwest

This alternative and the other proposed action components would significantly affect 14 separate areas.

MP A26 through A30, Green River crossing; and around Goslin Mountain.
MP A40 through A42, area between Richard's Gap and the booster pump station.

The other 12 areas would be the same as identified for the proposed action (Table 4-22).

Willow Creek

This alternative and the other proposed action components would significantly affect 16 separate areas.

MP A31 through A32, exit from Rye Grass Draw
MP A33 through A34, Green River crossing
MP A39 through A40, head of Jesse Ewing Canyon
MP A48 through A51, area between Richard's Gap and the booster pump station.

The other 12 areas would be the same as identified for the proposed action (Table 4-22).

4.9.6 Recreation Resources

Proposed pipeline construction related activity along State Highway 44 along an area referred to as the "Drive Through The Ages" would temporarily diminish the quality of sightseeing experiences from 2 to 4 weeks. The crossing of the Green River would eliminate river running and fishing opportunities at the crossing points for portions of 3 to 4 days. Noise, dust, and visual intrusions during pipeline construction would cause a decline in user experience at the Dripping Springs Campground and Little Hole Day Use area along the Northwest alternative route. Vehicular access into the Little Hole area would likely be affected during pipeline construction. The quality of primitive recreation experiences within the Red Creek Watershed ACEC would be temporarily diminished during the construction phase of the projects. The proposed booster station and 50-foot tall microwave tower within the ACEC would be visible from the auto pull-out along U.S. Highway 191 which would effect the visual quality of the area and the recreation experience. ORV use of the proposed pipeline right-of-way would continue to pose problems for local field managers, especially in the key issue areas such as Red Creek Canyon, Rye Grass Draw, Jesse Ewing Canyon, Goslin Mountain, and Willow Creek. Population growth in the Rock Springs, Wyoming, area due to the construction of the proposed phosphate fertilizer plant and ancillary facilities would likely cause a temporary (1 to 2 years) decline in local hunting opportunities and increases in poaching and other game law violations. The utilization of developed recreation facilities, especially within the Flaming Gorge NRA, would also be expected to increase during this construction period. The quality of the recreation experience at Davis Bottom would be diminished over the long term.

4.9.7 Wilderness

The proposed slurry pipeline construction activity along the northwest portion of the Red Creek Badlands WSA would cause short-term, temporary (4 to 6 weeks) impacts upon the quality of user experiences. The sights of heavy construction equipment, dust caused by pipeline construction activity, and the possible need for blasting causing some degree of noise impacts, could be offensive to some users, thereby, temporarily diminishing the quality of their primitive recreational experiences within the northwest portion of the WSA.

4.9.8 Cultural Resources

Cultural resources are nonrenewable and irreplaceable and their physical destruction would be a commitment of the resource for the Chevron Phosphate Project. This would occur to those significant cultural resources that could not be avoided or mitigated and to buried, unknown cultural resources that are destroyed during land modification.

4.9.9 Soils and Vegetation

Vegetation would be removed for the life of the project components on road surfaces, buildings sites, railroad surfaces and pumping stations. Acres occupied and not revegetated are identified in Tables 4-23, 4-27, and 4-31. Accelerated wind and water erosion would occur along linear facility rights-of-way during construction.

The proposed action would disturb 1,033 acres of sensitive area (combination of precipitation, slopes, and soil properties). Depending on alternative combinations, this could range up to a maximum of 1,163 acres (Middle Firehole, Northwest, and Jensen alternatives).

Loss of vegetation from construction activities would remove vegetation for forage and soil stability in varying degrees for a period of 3 to 5 years, and for the long term, where permanent facilities are constructed.

4.9.10 Agriculture

Construction of the Jensen alternative would result in an unavoidable loss of 6 acres of crop production for one growing season.

4.9.11 Ruptures and Spills

Any impacts which would occur as a result of a rupture or spill, as identified in section 4.2.13, would be considered adverse and unavoidable.

4.10 LONG-TERM ENVIRONMENTAL CONSEQUENCES

This section provides a perspective of the effects of the proposed project and alternatives on the long-term use of the human environment. Of special concern are any cumulative impacts and any irreversible and irretrievable commitments of resources. The cumulative impacts, trends, long-term benefits and tradeoffs are discussed below.

4.10.1 Trends Having a Significant Impact on Environmental Values

Chevron's proposed pipeline would be one of an increasing number of pipelines built to transport a phosphate slurry between a mine and a processing plant. A number of these types of lines are presently in operation in the United States, with others presently being designed and constructed.

Successful operation of this project would continue to add toward the trend to transport phosphate in a slurry pipeline rather than solely by conventional means such as rail and trucks. Increased movement of phosphate, or other minerals, could result in a trend to move large volumes of water from areas where water availability and usage is of high public concern, requiring careful and thoughtful water management planning to offset any issues of water quality or volumes being used for slurry purposes. Depending on the location selected, a trend for a new corridor could be established (e.g., Red Creek Canyon).

4.10.2 Benefits and Trade-Offs

A number of long- and short-term benefits and trade-offs can be identified as they relate to a number of resource values which could be affected from implementation of the proposed project.

Benefits

Water Resources: If saline water were used from the Big Sandy Salinity Control Project River Unit for plant processing water, the salinity of the Colorado River could be reduced by an estimated 1 milligram per liter per year at the inflow to Imperial Dam in California. (Refer to Water Resources Section 4.2.1.)

Employment: Employment would be provided during both construction and operation of the proposed project. Construction employment from 1983 through 1986 would total 2,128 worker-years. Operation employment would total 11,375 worker-years during the 30-year life of the project. (These projections do not include the work force at the phosphate mine.)

Tax Revenues: Property and use taxes imposed during construction and operation of the proposed project could contribute toward funding government services in the counties crossed by the pipeline project.

Cultural Resources: Information gained during cultural resource inventory, data recovery, and other investigations would provide long-term benefits to the understanding of earlier cultures.

Trade-Offs

Water Resources: If plant water were obtained by the withdrawal and use of 22,500 ac-ft/yr from the Fontenelle Reservoir, the increase in salinity at Imperial Dam in California, would be approximately 1 mg/l, which represents approximately $472,000 worth of damages annually to the Colorado River Salinity Program.

Socioeconomics: The increase in population and work force would require a small percentage increase in governmental administrative services, educational personnel, health care professionals, child care specialists, and housing units (Section 4.2.2). A demand for an increase in governmental expenditures would accompany the increase in demands for public facilities and services.

Air Quality: While the air quality would be affected by fugitive dust and other emissions during construction and operation, the increased visibility and pollution level is expected to be well within established limits. However, this project would consume a portion of the allowable PSD increase, which would prevent the use of this increment by other types of development.

Wildlife: Birds and other wildlife may experience debilitating or lethal effects from the chemicals in the standing water area at the gypsum impoundment. Heavy losses to birds from poisoning and potential infiltration of fluoride could cause fluorosis in pronghorn and sage grouse.

Visual Resources: The visual resources in the project area, primarily near surface facilities and where the slurry line would cross the Green River, would be adversely affected generally for the life of the project. Most impacts would be long term, for the life of the project or longer, until facilities are removed and the landscape rehabilitated to a point where impacts would not generally be visually perceived.

Cultural Resources: Construction of the project could potentially destroy some unknown subsurface historical or archaeological resources. Knowledge would be lost which could have been gained from these unexcavated sites.

Materials: Construction and operation of the project would result in the one-time use of some building materials and supplies. Many other materials and supplies could be reused or recycled when surface facilities are removed at project termination.

Energy: Energy expended on this project in the manufacture and transport of materials to the site would not be available for other uses. Gasoline and diesel fuel would be burned by vehicles and machinery during construction of the facilities. Energy would also be consumed during operation, at the rate of 4.0 percent of the total energy transported.

4.10.3 Commitment of Resources

Construction and operation of the proposed project and all alternatives may result in either the irreversible or irretrievable commitment of certain environmental or energy resources. An irreversible commitment of a resource is one that cannot be changed once it occurs; an irretrievable commitment means the resource cannot be recovered or reused. Other resources may be adversely affected for the short term.

Long term is defined for this project as the 30-year life of the project or longer. Neither the proposed project nor any of the alternatives would decrease the long-term productivity of the environment and resources which it would cross, other than the consumption of energy resources through the life of the project.

The short-term and long-term impacts to various resources from implementation of the components of the proposed action or alternatives are illustrated in Table 4-33.

TABLE 4-33
SHORT-TERM AND LONG-TERM IMPACTS RESULTING FROM THE PROPOSED ACTION OR ALTERNATIVES

Resource	Irreversible Impacts	Irretrievable Impacts	Relationship of Short-Term Use of Environment and Long-Term Productivity
Vegetation	No	Yes	Most vegetation could be restored to preconstruction conditions and the long-term productivity would not be impaired.
Wildlife	No	Yes	Short-term decreases in the local populations of small mammals and birds could occur. Some small terrestrial animals would be lost during facility construction and aquatic species would be lost during stream crossing construction. Long-term productivity would not be impaired other than through loss of life during construction.
Soils	No	Yes	Increased erosion would gradually return to normal rates, as revegetation and soil stabilization would take place. Long-term productivity would not be impaired.
Water	Yes	Yes	The water used in the manufacture of fertilizer would be irreversible and irretrievably lost.
Grazing	No	Yes	Destruction of forage would be a temporary impact that could change grazing patterns or alter management systems for one to three grazing seasons.
Cultural Resources	Yes	Yes	Disturbance or destruction of cultural resources could result in the loss of some scientific understanding, which would be irretrievable.
Visual Resources	No	Yes	Some visual impacts would remain for the life of the project or longer until the landscape were rehabilitated, including the removal of structures.
Paleontology	Yes	Yes	Destruction of paleontological resources would be an irreversible, permanent commitment of the resource.

TABLE 4-33
SHORT-TERM AND LONG-TERM IMPACTS RESULTING FROM THE PROPOSED ACTION OR ALTERNATIVES (concluded)

Resource	Irreversible Impacts	Irretrievable Impacts	Relationship of Short-Term Use of Environment and Long-Term Productivity
Fuel	Yes	Yes	The fuel used in vehicles and other machinery during construction and operation would be a permanent, irreversible commitment of the resource.
Energy	Yes	Yes	The construction and operation of the project would consume energy which would be a permanent, irreversible commitment of the energy resources.

NOTE: For specifics on the units of these resources that would be affected by the proposed action and alternatives, see Chapter 2 or the appropriate resource sections in Chapters 3 and 4.

REFERENCES CITED

In order to help the reader locate copies of these references, symbols are used to indicate the following:

a - Available from the Bureau of Land Management (BLM), EIS Office, 555 Zang Street, First Floor East, Denver, Colorado 80228
b - Available for inspection at BLM District Office, Rock Springs, Wyoming
c - Available for inspection at BLM District Office, Vernal, Utah
d - Available from Chevron Chemical Company, P.O. Box 3744, San Francisco, California 94119
e - Available from Industrial Siting Administration, Boyd Building, Suite 500, Cheyenne, Wyoming 82002
f -Available at any public library
g - Available from U.S. Forest Service, Forest Supervisor's Office, Ashley National Forest, Vernal, Utah

The appropriate symbols will appear at the end of each citation.

American Association of State Highway and Transportation Officials. 1975 Highway capacity manual. Washington, D.C. f

Bender, H.E. Jr. 1980. **Uintah railway, the Gilsonite route.** Berkeley: Howell-North Books. f

Bonebrake, B., Project Biologist, Flaming Gorge Fisheries Investigations, Utah Division of Wildlife Resources. 1982. **Fishery habitat quality in the Green River below Flaming Gorge Reservoir and below Red Creek.** (Personal communication with Ray Boyd, BLM EIS Office.) a

Bradley, J. 1976. **Report from Fort Apache on crime and violence in Southwest Wyoming.** Cheyenne, Wyoming: Wyoming Game and Fish Department. a

BLM—See U.S. Department of the Interior, Bureau of Land Management

Chamberlain, Leon. 1977. **Soil survey and evaluation—Dutch John bench pinyon-juniper conversion project**. Flaming Gorge Ranger District Ashley National Forest. a, g

__________. 1978. **Soil survey and evaluation—Dutch John bench pinyon-juniper project addition.** Flaming Gorge Ranger District Ashley National Forest (unpublished). a, g

Chevron Chemical Company. 1981. **Chevron phosphate slurry pipeline feasibility study.** Bechtel Petroleum, Inc. (Job No. 139 47.029). d

Chevron Chemical Company. 1982[a] **Project Description, Chevron Phosphate Project, Sweetwater County, Wyoming.** San Francisco, California. a, b, c

Chevron Chemical Company. 1982[b] . **Wyoming Industrial Siting Council permit application for the Chevron Phosphate Project, Sweetwater County, Wyoming.** San Francisco, California. a, b, c, e

Chevron Chemical Company. 1982[a] . **Industrial Siting Administration questions on the ISC permit application.** (Responses in letter form to Mr. Richard C. Moore, August 23, 1982). e

Collins, Susan M., C. Jennings, C. Fraser, A. Schroedl, and P. Smith, 1980 **Cultural resource inventory, MAPCO's Rocky Mountain liquid hydrocarbons pipeline preliminary report mainline manuscript.** Woodward-Clyde Consultants, San Francisco. c

Cordner, B. 1981. Air Quality Specialist, Utah Division of Environmental Health, Salt Lake City, Utah. (Telephone communication). d

Cronquist, Arthur, A. Holmgren, N. Holmgren, and J. Reveal. 1972 *Intermountain flora, vascular plants of the Intermountain West, USA* **The New York Botanical Garden**. Vol. 1. a

Day, Kent C. and D.S. Dibble. 1963. **Archaeological survey of the Flaming Gorge Reservoir Area, Wyoming-Utah**. University of Utah Anthropological Papers No. 65. c

Decker, Dean. 1982. **Personal communication and inspection of district cultural resource files.** a, b

Elms, J. 1981. Air Quality Specialist, U.S. Forest Service, Denver, Colorado. (Telephone communication). d

Fenneman, N.M. 1931. **Physiography of the western United States.** New York and London: McGraw-Hill Book Company. f

Forsyth, D.W. 1980. **Archaeological survey in Uintah County, Utah.** (Under contract for TOSCO Corporation). Museum of Peoples and Cultures, Provo, Utah: Brigham Young University. c

Frison, George C. 1978. **Prehistoric hunters of the High Plains.** New York: Academic Press. f

FS—See U.S. Department of Agriculture, Forest Service.

FWS—See U.S. Department of the Interior, Fish and Wildlife Service

Gardner, Dudley. 1981. **Historical overview and evaluation of the Cherokee Trail, T 12 N, R 97 W. Sections 14 and 15.** Manuscript, Archaeological Western Wyoming College, Rock Springs. b

Goetzmann, William H. 1959. **Army explorations in the American West 1803-1863.** New Haven: Yale University Press. f

Gough, L.P., H.T. Shacklette and A.A. Case. 1979. **Element concentrations toxic to plants, animals and man.** U.S. Geological Survey. (Bulletin 1466). Washington, D.C. a

Iacovetta, Beverly and T. McFadden. 1977. **Cultural resources survey report Bridger Valley Electric Association power line and Northwest Pipeline Corporation rectifier and power line Daggett County, Utah.** Vernal: Ashley National Forest. c

Jennings, Jesse D. 1978. **Prehistory of Utah and the Eastern Great Basin.** University of Utah Anthropological Papers, No. 98. c

Jones, K.T. and K.L. MacKay. 1980. **Cultural resources existing data inventory, Vernal District Utah.** Salt Lake City: University of Utah. c

Larralde, S.L. and S.M. Chandler. 1981. **Archaeological inventory in the Seep Ridge cultural study tract, Uintah County, Northeastern Utah with a regional predictive model for site locations.** Montrose, Colorado: Dickens and Associates. c

Lindsay, Lamar W. 1977. **An archeological survey of Clay Basin, Daggett County, Utah.** Prepared for Mountain Fuel Supply Company. Rock Springs. c

Lukow, T. 1981. Environmental Specialist, Bureau of Land Management, Cheyenne, Wyoming. (Telephone communication). d

Meyer, Joseph P., Wyoming Legislative Services Office. August 31, 1982. **Wyoming school financing.** (Personal communication). Cheyenne, Wyoming. a

Mohr, R. 1981. Air Pollution Control Specialist, Air Pollution Control Division, Colorado Department of Health, Denver, Colorado. (Telephone communication). d

Morgan, Dale L. 1964. **The West of William Henry Ashley...1822-1838.** Denver Old West Publishing Company. Denver, Colorado. f

Moss, John H., with K. Bryan, G. Holmes, L. Satterthwaite, Jr., J. Hansen, C Schultz, and W. Frankforter (Loren C. Eisely, editor). **1951. Early man in the Eden Valley.** Philadelphia: University of Pennsylvania Museum. f

Mountain West Research—North, Inc. 1982. **Staff review of the Wyoming Industrial Siting Council Permit Application for the Chevron Phosphate Plant, Sweetwater County, Wyoming.** (Unpublished Report). Billings, Montana. e

Nielson, Woodrow and T.B. Hutchings. 1972. **Soil survey of Red Creek drainage portion of Vernal soil survey.** Special report prepared for Bureau of Land Management in accord with cooperative agreement dated 1971. a, b

NPS—See U.S. Department of the Interior, National Park Service

Olendorff, R.R., A.D. Miller, and R.N. Lehman. 1981. **Suggested practices for raptor protection on power lines. The state of the art in 1981.** Raptor Research Report No. 4. Raptor Research Foundation, Inc. Department of Vet. Biology. University of Minnesota, St. Paul, Minnesota. a

Phillips, Blane. 1982. (Personnal communication and inspection of district cultural resource files). a, c

Rochelle, B. 1981. Environmental Protection Specialist, Environmental Protection Agency Region VIII, Denver, Colorado. (Telephone communication). d

Sharrock, Floyd W. 1966. **Prehistoric occupation patterns in southwest Wyoming and cultural relationships with the Great Basin and Plains culture areas.** University of Utah Anthropological Papers, No. 77. Salt Lake City, Utah. b

State of Wyoming. 1982. **Water Contract** (entered into between the State of Wyoming, County of Laramie, and the Chevron Chemical Company, a Delaware Corporation) for the Chevron Phosphate Project. Laramie, Wyoming: February 15, 1982. Sections A through L. a, d, e

Stokes, W.L. 1979. *Subdivisions of the major physiographic provinces in Utah.* **Utah Geology Vol.** 4, No. 1. Salt Lake City: Utah Geological and Mineral Survey. f

Suttie, J.W. 1971. **Effects of fluoride on animals.** Biological Effects of Atmospheric Pollutants - Fluorides, National Academy of Sciences—National Research Council, Washington, D.C. a

Tennent, William L. 1981. *John Jarvie of Brown's Peak.* **Cultural resource series No. 7.** Salt Lake City: Bureau of Land Management, Utah. c

Unger, Richard. 1982. City Planner, City of Rock Springs. (Personal conservation with WRC). d

U.S. Department of Agriculture, Forest Service. 1982. **Grazing allotment and data.** Collected at Vernal, Utah, from Terry Hopson. a, g

________. 1974. **Visual management system.** Agriculture Handbook No. 462. Washington, DC: Government Printing Office. a, g

________. October 1976. **Dispersed recreation on three forest road systems for Washington and Oregon**. Forest Service Research Note No. PNW-280, Portland, Oregon. f

________. October 25, 1977. **Flaming Gorge National Recreation Area final environmental statement and management plan.** U.S. Government Printing Office: **1977-777-027/1 Region No. 8.** g

________. **May 2, 1982[a]. Travel plan Vernal Ranger District, Ashley National Forest**. g

________. May 2, 1982[b]. **Travel plan Flaming Gorge Ranger District, Ashley National Forest.** g

________. 1982[c]. **Visual quality objectives for affected portions of the Ashley National Forest and Flaming Gorge National Recreation Area.** (Unpublished maps). Vernal, Utah. g

U.S. Department of Agriculture, Soil Conservation Service. 1970. **Utah conservation needs inventory report.** Salt Lake City, Utah. (November 1977 update). a

________________. 1981. **Land resource regions and major land resources areas of the United States.** Agriculture Handbook No. 296. Washington, DC: Government Printing Office. a

________, in cooperation with the U.S. Department of Interior, Bureau of Land Management and Utah Agricultural Experiment Station. 1979. **Soil survey of portions of Duchesne and Uintah Counties, Utah.** a, c

U.S. Department of Commerce, Bureau of Economic Analysis. 1982. **Regional economic information system.** Washington, D.C. f

United States Department of the Interior, Bureau of Land Management. 1977[a]. **Browns Park Unit Resource Analysis.** Utah ________________. c

________. 1977[b]. **Diamond Mountain unit resource analysis.** c

________. 1978[a]. **Manual series 8400: visual resource management.** Washington, DC: Government Printing Office. a

________. 1978[b]. **Diamond Mountain and Browns Park unit resource analysis**. (unpublished manuscript). Bureau of Land Management, Vernal District, Vernal, Utah. c

________. 1979[a]. **Visual resource inventory and evaluation of the Northeast Utah Regional Area.** Vernal, Utah. Phillip E. Flores Associates, Inc. c

________. 1979[b]. **Ashley Creek Unit Resource Analysis**. Utah State Office. Salt Lake City, Utah. c

________. 1979[c]. **Three Corners Grazing Management Draft Environmental Statement.** U.S. Government Printing Office: 1979-0-769-688. a

________. 1980[a]. **Interim management policy and guidelines for lands under wilderness review,** 1979. Washington, DC: Government Printing Office. b, c

________. 1980[b]. **Visual resource management program**. Washington, DC: Government Printing Office. a, b, c

________. 1981[a]. **Big Sandy/Salt Wells oil and gas environmental assessment.** Rock Springs, Wyoming. b

________. 1981[b]. **Environmental impact statement on the Energy Transportation Systems, Inc. coal slurry pipeline transportation project.** Office of Special projects. Denver, Colorado. a

________. 1981[c]. **Red Creek watershed management plan.** Joint Watershed Management Plan, Salt Wells Resource Area, Wyoming and Diamond Mountain Resource Area, Utah, Rock Springs, Wyoming, and Vernal, Utah, District Offices. b, c

________. May 1981. **Wyoming Wilderness Study Areas: A Final Inventory Report,** pp. 72-73. b

________. 1982[a]. **Salt Wells management framework plan** Rock Springs, Wyoming. b

U.S. Department of the Interior, Bureau of Land Management, 1982b. **Uintah basin synfuels development.** Draft Environmental Impact Statement. Vernal, Utah District Office, BLM. August 1982. a

U.S. Department of the Interior, Fish and Wildlife Service. 1982[a]. **Endangered fish spawning areas in the Green River.**(Personal communication to Ray Boyd, BLM, EIS Services, from Jim Coyner, Fish and Wildlife Service, Salt Lake City, Utah.) a

_________. 1982c. **Losses of wildlife species in Trona ponds near Rock Springs, Wyoming.** (Personal communication to Ray Boyd, BLM, EIS Services, from Cindy Schroeder, Special Agent, Fish and Wildlife Service, Brigham City, Utah. a

_____, National Park Service, April 30, 1979. **Draft environmental impact statement study of the Green and Yampa rivers.** Denver Colorado. f

U.S. Environmental Protection Agency. 1976. **Quality criteria for water.** U.S. Environmental Protection Agency, Washington, D.C. a

_________________. 1979. Existing Visibility Levels in the United States. EPA-450/5-79-010 September 1979. a, b, c, e

Utah Division of Wildlife Resources 1981. **Vertebrate wildlife species of Utah. Compiled by:** Earl A. Sparks. Pub. No. 81-2. Salt Lake City, Utah. a, c

_____. 1982. **Wildlife species occurrence on all Utah portions of Chevron project.** (Includes maps). Salt Lake City, Utah. a

Utah Office of the State Planning Coordinator. 1980. **Utah: 2000 a high development scenario.** Salt Lake City, Utah. c

Vernal City—Uintah County Planning Office. 1981. **Ashley Valley Master Plan.** Vernal, Utah. c

Walker, Walter. 1980. **History of the Cherokee Trail in Carbon County, Wyoming.** Manuscript, Department of Social Studies Education Columbia Pacific University, Mill Valley, California. d

Watts, Howard K. 1977. **Archeological survey report: Dutch John pinyon-juniper conversion project, Daggett County, Utah.** Vernal: Ashley National Forest. c

Wells, Richard F., and E. Knox. 1981. **Soil inventory of the Green River area, Wyoming.** Volumes I and II. Prepared by Soil and Land Use Technology, Inc., for U.S. Department of Interior, Bureau of Land Management, in cooperation with the U.S. Department of Agriculture, Soil Conservation Service, Rock Springs, Wyoming. a, b

Wilson, LeMoyne, M. Olsen, T. Hutchings, A. Southard, and A. Erickson. 1975 **Soils of Utah.** Agriculture Experiment Station Bulletin 492. Utah State University, Logan, Utah. a

Wyoming Department of Administration and Fiscal Control. 1981. **Census retrieval information service, report no. 5.** Cheyenne, Wyoming. b, e

Wyoming Department of Environmental Quality. 1982. **Application for air quality permit to construct for Chevron Chemical Company's phosphate project: vol. I.** (Prepared by TRC Environmental Consultants, Chevron Chemical Company, and Chevron Research Company). e

Wyoming Department of Environmental Quality. 1981. **Land quality division guideline. No. 10.** Cheyenne, Wyoming. b, e

Wyoming Game and Fish Department. 1977. **Current status and inventory of wildlife in Wyoming.** Wyoming Game and Fish Department, Cheyenne, Wyoming. a

_____. 1982. **Wildlife species occurrence on all Wyoming Portions of the Chevron Projects.** (Includes maps). Green River, Wyoming. a

Wyoming Recreation Commission. 1980. **Wyoming state comprehensive outdoor recreation plan,** Cheyenne: Wyoming Recreation Commission. e

Zitney, G.R. 1978. **Avian response to wastewater in a fertilizer manufacturing plant cooling pond.** Western Ecological Services Company, San Rafael, California. a

GLOSSARY

ABSORPTION TOWER—A chemical process tower designed to cause the joining or absorbing of one chemical onto another specific chemical.

ACRE-FOOT—The quantity of material that will cover 1 acre of land 1 foot deep; equivalent to 325,850 gallons.

AIR SPARGING—Agitation of a liquid by means of compressed air or gas entering through a pipe.

ALLUVIAL FAN—Eroded materials (alluvium) that are deposited at the mouth of a canyon thus forming a fan shape.

ANODE—In cathodic protection, an auxiliary or a sacrificial metal slug higher in the electromotive series than the pipe material. The anode metal is corroded or sacrificed by contributing electrons to the pipeline metal via wires.

BEDDING MATERIAL—Materials, most often sand, that are used to protect a pipe from projections in a trench.

BEDDING MATERIAL—Materials, most often sand, that are used to protect a pipe from projections in a trench.

BENEFICIATION PLANT—A plant which utilizes vaious processes to liberate (separate from unwanted constituents), concentrate, and dry phosphate rock mineral.

BENTHIC SUBSTRATE—River bottom.

BLOWDOWN—The continuous or intermittent wasting of small amounts of circulating water. Its purpose is to prevent an increase in the concentration of solids in the water due to evaporation, normally expressed as a percentage of the water being circulated.

CATHODIC PROTECTION—Corrosion protection by sacrificing a replacable electron sink.

COFFERDAM—A temporary dam that is used to divert water.

DENDRITIC DRAINAGE—Branching like a tree.

DISPERSED RECREATION—Camping in undeveloped sites and informal daytime recreation.

FIFTY-YEAR PEAK RUNOFF EVENT—The maximum amount of water that can be expected to run off from a storm that has a chance of occurring once every 50 years.

FLUOROSIS—A disease caused by an accumulation of fluorine in bones and teeth. Accumulations of this element in bones of cattle can cause severe lameness.

FLUOSILICIC ACID—H_1SiF_6—Acid recovered from scrubbers in the phosphoric and superphosphoric acid plants; this acid is used to fluoridate municipal water supplies.

GYPSUM—Hydrous calcium sulfate, $CaS0_4.2H_2$.

INFRASTRUCTURE—The underlying foundation or basic framework, as the communication and transportation facilities of a community.

LITHIC MATERIALS—Stone materials.

LITHIC SCATTERS—Evidence of man's activity in stone culture.

NO_x—An expression for the general category of nitrogen oxides.

NOXIOUS—An invading plant species with no economic value, often a harmful species.

OFF-ROAD VEHICLE (ORV)—A vehicle (including four-wheel drive vehicles, trail bikes, snowmobiles, etc., but excluding helicopters, fixed-wing aircraft, and boats) capable of traveling off-road over land, water, ice, snow, sand, marshes, etc.

pH—Degree of acidity or alkalinity; the negative log of the hydrogen ion activity. Below pH7, hydrogen ion activity results in acidity; above pH7, hydroxyl ion activity results in alkalinity.

PHYSIOGRAPHIC PROVINCE—A region that has similar topographic form.

RECTIFIER—A device for converting alternating current into direct current. Used in the cathodic protection of pipelines.

RIPARIAN (HABITAT)—A wetland habitat.

RIPRAP—An erosion control material, generally rock, that is placed on surfaces that are in contact with water.

SCRUBBER—An apparatus for removing impurities, especially from gases.

SO_x—An expression for the general category of sulfur oxides.

SUPERPHOSPHORIC ACID—68 percent phosphoric acid, P_2O_5.

SWITCHBACKED—A zigzag pattern method of ascending or descending a hill at a constant, often low, grade.

TERRACE—A raised portion of an ancient riverbed or riverbank which is composed of alluvium.

VISUAL RESOURCE MANAGEMENT—The planning, design, and implementation of management objectives to provide acceptable levels of visual impacts for all resource management activities.

WASTE-HEAT BOILER—A boiler which uses otherwise wasted process reaction heat to preheat water or make steam.

WATERBARS—An erosion control device that spreads water.

WILD AND SCENIC RIVERS ACT—Provides for the designation and protection of rivers of national significance if they are free-flowing and contain one or more outstandingly remarkable scenic, recreation, geologic, fish and wildlife, historic, cultural, or other similar values.

WILDERNESS—A wilderness, in contrast with those areas where man and his own works dominate the landscape, is recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain.

WILDERNESS AREA—An area formally designated by Congress as part of the National Wilderness Preservation System.

WILDERNESS STUDY AREA—A roadless area or island that has been inventoried and found to have wilderness characteristics as described in section 603 of the FLPMA of 1976 and section 2(c) of the Wilderness Act of 1964 (78 Stat. 891).

ABBREVIATION AND ACRONYMS

ACEC—Area of Critical Environmental Concern

AUM—animal unit month

BLM—Bureau of Land Management, U.S. Department of the Interior

CEQ—Council on Environmental Quality

Chevron—Chevron Chemical Company

CO—Construction Operation plan

COE—Corps of Engineers, U.S. Department of the Army

EIS—Environmental Impact Statement

EPA—U.S. Environmental Protection Agency

FAA—Federal Aviation Adminstration

FCC—Federal Communications Commission

FLPMA—Federal Land Policy Management Act

FS—Forest Service, U.S. Department of the Agriculture

FWS—Fish and Wildlife Service

gpm—gallons per minute

ISA—State of Wyoming Industrial Siting Administration

kV—kilo-Volt

MAPCO—Mid-America Pipeline Company

MLRA—major land resource area

MP—milepost

NAAQS—National Ambient Air Quality Standard

NPS—National Park Service, U.S. Department of the Interior

NRA—National Recreation Area

ORV—off-road vehicle

OSHA—Occupational Safety and Health Administration

P.L.—public law

PSD—prevention of significant deterioration

RARE II—FS second Roadless Area Review and Evaluation

RMP—Resource Management Plan

RMP/EIS—Resource Management Plan/Environmental Impact Statement

SCC—Sweetwater County Commissioners

SCPD—Sweetwater County Planning Department

SCS—Soil Conservation Service

SHPO—State Historic Preservation Officer

TPD—tons per day

TPOD—tons per operating day

TPY—tons per year

TSP—total suspended particulates

TSS—total suspended solids

TUP—temporary use permits

UBWPC—Utah Bureau of Water Pollution Control

UDWR—Utah Division of Wildlife Resources

USDSL—Utah State Department of State Lands

USEO—Utah State Engineer's Office

USLE—Universal Soil Loss Equation

VQO—Visual Quality Objectives

VRM—Visual Resource Management

WDEQ-AQD—Wyoming Department of Environmental Quality-Air Quality Division

WDEQ-WQD—Wyoming Department of Environmental Quality-Water Quality Division

WFM—Wyoming Fire Marshall

WISC—Wyoming Industrial Siting Council

WSA—Wilderness Study Area

WSEO—Wyoming State Engineer's Office

WSHD—Wyoming State Highway Department

WSLB—Wyoming State Land Board

LIST OF PREPARERS FOR THE CHEVRON PHOSPHATE FERTILIZER PLANT COMPLEX

NAME	EDUCATION	EIS RESPONSIBILITY
Bureau of Land Management		
Richard E. Traylor, Project Leader	BS, Forestry MS, Forestry Management	Project Leader, Environmental Coordinator; Regulation Compliance, Quality Review
Byron Shark, Assistant Project Leader	BS, Engineering	Assistant Project Leader; Project and Alternative Descriptions
Janet J. Parker, Editor		Coordination, Review, and Editing
Bobby S. Weisz, Project Secretary		Project Secretary and Assistant Editor; Editing, List of Preparers, and References Cited
Alan E. Amen, Soil Scientist	BS, General Agronomy	Soils, Agriculture, Revegetation, Graphics Coordination
Raymond J. Boyd, Wildlife Biologist	BS, General Science BS, Game Management MS, Range Management	Technical Team Leader; Wildlife, Threatened and Endangered Species
Gerald P. Brandvold, Botanist	BS, Range Management	Vegetation, Threatened and Endangered Species, Grazing, Ranching
Larcie D. Burnett, Archaeologist	BA, Anthropology MA, Anthropology	Cultural Resources
Lois A. Cocker, Environmental Specialist	BS, General Science MA, Science Curriculum Development	Editing
George E. Detsis, Environmental Protection Specialist	BS, Recreation Planning and Administration MS, Forest Resources	Authorizing Actions, Interrelated Projects, Recreation Resources, Wilderness, General Measures

LIST OF PREPARERS FOR THE CHEVRON PHOSPHATE FERTILIZER PLANT COMPLEX

NAME	EDUCATION	EIS RESPONSIBILITY
Gary R. Konwinski, Geologist	BS, Soil Science MS, Environmental Science Graduate Work in Geology and Water Resources	Surface Water Resources, Geology, Mineral Resources, Paleontology
Stanley V. Specht, Landscape Architect	BS, Landscape Architecture MLA, Landscape Architecture MUP, Urban Planning	Visual Resources
Norma J. Sumpter, Word Processor		Text Production
Pete Van Wyhe, Supervisory Printing Specialist	BS, Business Management	Production and Graphics Coordination
Troy D. Bunch, Illustrator	AA, Art AAS, Audio-Visual Production	Cover, Technical Illustrations, Graphics
Keith Francis, Lead Professional Cartographer	BA, Geology MS, Remote Sensing	Cartographics and Graphics
Constance A. Hackathorn Professional Cartographer	Cartography Psychology	Cartographics and Graphics
Jeanine L. Ayers, Lead Word Processor		Text Production and Coordination
Coralea Wasson, Word Processor		Text Production
Ralph Heft	BS, Forestry	BLM Utah Lead Contact
Bill McMahan	BS, Wildlife Management	Rock Springs Lead Contact
Ken Harrison	BS, Forestry/Wildlife	Wyoming State Office Lead Contact
Bureau of Reclamation		
Harold Sersland	BS, Forestry/Wildlife Management	Lead Contact
Cliff Alldredge	BS, Civil Engineering	Water Resources

LIST OF PREPARERS FOR THE CHEVRON PHOSPHATE FERTILIZER PLANT COMPLEX

NAME	EDUCATION	EIS RESPONSIBILITY
John Newman	BS, Civil Engineering	Water Resources
U.S. Fish and Wildlife Service		
Jim Coyner	BA, Zoology MS, Wildlife Management	Lead Contact/Aquatic Biology
U.S. Forest Service		
Terry Hopson	BS, Forest and Range Management	Lead Contact
Mountain West		
Robin Meale	BS, Mathematics and Economics MS, Economics	Socioeconomics, Transportation Networks
Industrial Siting Administration		
Richard Moore	BS, Mathematics MS, Civil Engineering	Project Leader
Tom Collins	BS, Wildlife Management MS, Environmental Physiology/Ecology PhD, Wildlife Biology/Ecology	Staff Manager
Steve Bartenhagen	BS, Economics MS, Economics	Liaison for Mountain West
Bob Elder	BS, Biology MS, Physiology PhD, Aquatic Biology/Ecology	Land Use Plans, Authorizing Actions, General Measures
Becky Mathisen	BS, Civil Engineering	Health and Safety Facility Description
Linda Harrison		Administrative Assistant
Erica McMikle		Word Processing Technician
Lee Gribovicz	BS, Environmental Eng.	Air Quality

APPENDIX 1
CONSULTATION AND COORDINATION

PUBLIC INVOLVEMENT IN THE SCOPING PROCESS

The first step in preparing an environmental impact statement (EIS) is called "scoping." The scope of an EIS is the range of actions, alternatives, and impacts to be included in the document. The purpose of scoping is to determine the significant issues related to a proposed action that should be included in the EIS. Scoping is designed to reduce some of the past inefficiencies associated with EIS preparation.

The Bureau of Land Management (BLM) sponsored public meetings in Vernal and Dutch John, Utah, and the Sweetwater County Planning and Zoning Commission sponsored public hearings in Rock Springs, Wyoming, designed to involve interested citizens and groups in the scoping process. An announcement about the BLM meetings was published in the June 25, 1982 *Federal Register* and distributed in local newspapers. An announcement about the Sweetwater County public hearings for rezoning was publicized through local radio announcements and newspapers. Information on the meetings was also sent to government organizations and other groups that were potentially interested in the EIS process.

Method of Scoping

The scoping process for the Chevron Phosphate Fertilizer Complex consisted of public meetings, agency meetings, and informal conversations with interested parties within the affected area. With the assistance of Federal and State agencies, local entities, and private individuals, the significant issues and concerns were identified for analysis in the EIS. Insignificant issues were also identified so that they could be eliminated from the scope of the EIS.

In the early stages of the project (February 1982), the Sweetwater County Planning and Zoning Commission held public hearings in Wyoming on Chevron's proposed rezoning application. As a result of these discussions, the following preliminary issues were identified and attendance at the forthcoming public meetings was encouraged.

Sweetwater County Planning and Zoning
Public Hearing
February 9, 1982

Attendees

Robert Volcic
Kim Briggs
Charles Jamieson
Dennis Watt
Peter J. Rust
Dean Forsgren
Sister Dorothy Henscheid
Louis Barto
Al Kolman
Lynn Pfeiffer
Antone Pivik

Summary of Issues

1. Concern with easterly winds and that not all fertilizer plants employ the newest technology.

2. Concern with keeping the public adequately informed.

3. Air Pollution and the effect of construction on grazing lands.

4. Concern with environmental quality.

5. Increased traffic on Highway 430.

6. Impact to the City of Rock Springs.

7. Plant safety.

Sweetwater County Planning and Zoning
Recessed Public Hearing
February 25, 1982

Attendees

Name	Representing
Robert Volcic	Commission
Kim Briggs	Commission
Charles Jamieson	Commission
Tom Norris	Commission
Dick Griffin	Commission
Dennis L. Watt	Planning
Peter J. Rust	Land Use
Dean Forsgren	Chevron Chemical Company
Alex Maser	Rock Springs Chamber of Commerce
Pam Miller	Wyoming Job Service
Bob Preston	First Wyoming Bank
Dick Blankenship	Southwest Wyoming Industrial Association
John Gardner	First Security Bank
Keith West	Mayor, City of Rock Springs

Letters from the City of Rock Springs residents were read during this meeting. Their comments and concerns were incorporated as part of the minutes to this meeting.

Summary of Issues

1. Creation of permanent jobs for economic stability and diversification.

2. Concern regarding easterly winds and odor emissions from the plant.

3. Concern with water quality.

4. Dust control and abandonment of dump site.

5. Increased traffic on Highway 430.

6. Impact on wildlife.

After these meetings, it was announced that BLM would hold public scoping meetings in Utah for the Chevron Phosphate Fertilizer Complex. Information regarding the meetings was then publicized throughout the affected areas through a Notice of Intent in the Federal Register and through the media. Notification of the meetings was also sent to Federal and State government organizations and other potentially interested groups within the area.

Public meetings were then conducted in Dutch John and Vernal, Utah, on July 28 and 29, 1982, respectively. Interested individuals, groups, and local agencies were given the opportunity to voice their concerns and raise issues which they felt merited consideration in the EIS.

The basic format of the scoping meetings consisted of a description of the EIS process and scoping process, a description of the Chevron Phosphate Project, and a question and answer session. A news release covering the major points of the project was given to each attendee. Since the attendance at the meetings was small, no work groups were formed as is traditional with scoping meetings. However, those in attendance were allowed to voice their views in an informal manner. The following comments were recorded and summarized and were used in analyzing of the proposed project.

Chevron Scoping Meeting
Dutch John, Utah
July 28, 1982

Attendees

Name	Representing
Penny Creasy	Self
Floyde D. Jackson	F.M. Fox and Associates, Inc.
Maxine Jackson F.M. Fox and Associates, Inc.	
Larry Davis	Utah Natural Resources
Lenore E. Campbell	Schmueser and Associates, Inc.
Carl S. Calbitt	County Commission
Fred Riding	Chevron Resources Company
Bill Fleming	Self
Dave Keddy	Self
Clay Perschon	Utah Division of Wildlife Resources

In addition there were representatives from BLM, Fish and Wildlife Service, Chevron, Bechtel Petroleum, and Mountain West Research, Inc.

Summary of Issues

1. Cost estimates for the routes.
2. Grade problem in Jesse Ewing Canyon and Red Creek.
3. The effect of another pipeline being constructed and whether this would be the last pipeline to be constructed in the area.
4. Effect of the pipeline on grazing, primarily Red Creek.
5. Will the entire pipeline be underground?

6. Addition of another road requiring maintenance or supplying more access for the public.
7. Which side of the road will the pipeline be on? Will it need a 404 permit? Could the pipeline traverse the Wildlife Refuge's new building site?
8. Visual impacts of the 15 percent grade cuts along the river corridor and access routes.
9. Location of the pipeline in relation to the Taylor Flat subdivision. Will it cross the spring and pastures in that area?
10. What is the construction schedule? How long will there be equipment and activity in the various areas?
11. Concern about the possible interruption of telephone service.
12. Concern about possible impacts to fish and wildlife.

Chevron Scoping Meeting
Vernal, Utah
July 29, 1982

Attendees

Name	**Representing**
Lenore E. Campbell	Schmueser and Associates, Inc.
Roby Stevens	Sunmount Cord
Nephi Atwood	Self
Keith Blow	Diversified Energy Services, Inc.
Gail Moore	Deseret News
Paul G. Stringham	Self
Gene W. Tedaick	Brotherhood of Carpenters
Carl A. Gaenesien	Self
Lorin Nicksen	Utah Department of National Resources and Energy
John E. Solum	Division of Water Rights
Harold H. Alexander	W.S. Hatch Company

In addition, there were representatives from BLM, Forest Service, Chevron, and Mountain West Research, Inc.

Summary of Issues:

1. What is the width of the MAPCO right-of-way? Unless Chevron replaces everything, it will not be allowed access on the private property and spring in Rye Grass.
2. The the possibility of using the water from the Big Sandy River instead of the Green River.
3. Concern about the visual impact to the land from construction of more pipelines in the area.
4. The miles of various lands that would be disturbed from construction of the pipeline.
5. The proposed alignment in relation to the MAPCO line.
6. Addressing all the routes in the EIS both pro and con.
7. Concern for private lands in the area, i.e., crossing and tearing up the land without returning it the way it was.

IDENTIFICATION OF ISSUES

The results of the scoping process, along with input from various federal and state agencies including an on-site field trip encompassing the proposed route and probable alternatives, identified the most significant issues associated with the project which are detailed in the EIS. The issues were prioritized according to the importance given to the issues by individuals.

Additionally, the following concerns were raised by persons who submitted written comments regarding the rezoning request for the project:

- Diversification of the economy;
- Opportunities for environmental improvements;
- Potential air pollution;
- Disposal of office and shop solid wastes;
- Disposal of wastes generated by plant and construction personnel;
- Reservoir permits for construction of ponds;
- Avoidance of critical wildlife habitats;
- Reseeding and recontouring of pipeline corridors;
- Location of construction camps and material storage;
- Access road useage;
- Protection of springs and wildlife water sources;
- Accessibility through Jesse Ewing Canyon; and
- Degree of grade.

RESULTS OF SCOPING

Issues identified by meeting participants and through written input have been used to determine the scope of the Chevron Phosphate Project EIS. The extent to which each resource is analyzed was partially determined by the concerns raised in the scoping meetings.

CONSULTATION AND COORDINATION

The agencies, groups, and individuals that will receive a copy of the draft EIS for formal review are as follows:

Federal Government Agencies
Department of the Interior
Bureau of Reclamation
Fish and Wildlife Service
National Park Service
Department of Agriculture
Forest Service
Soil Conservation Service
Advisory Council on Historic Preservation
Department of the Army
U.S. Army Corps of Engineers
Department of Transportation
Federal Highway Administration
Environmental Protection Agency
Federal Highway Administration

State Governments and Agencies
Office of the Industrial Siting Administration

Local Governments

Utah
Uintah County Commission
Daggett County Commission
Wyoming
Sweetwater County Commission

State Legislators
Utah
Wyoming

U.S. Senators and Representatives
Utah
Wyoming

Copies of the draft EIS may be inspected at the following offices:

- Wyoming State Office, 2515 Warren Avenue, Cheyenne, Wyoming 82001
- Rock Springs District Office, North Highway 187, Rock Springs, Wyoming 82901
- Utah State Office, University Club Building, 136 South Temple, Salt Lake City, Utah 84111
- Vernal District Office, 170 South 500 East, Vernal, Utah 84078

APPENDIX 2
REQUIRED GENERAL FEDERAL MEASURES, RECLAMATION PROCEDURES, AND CHEVRON STANDARD CONSTRUCTION AND OPERATION PROCEDURES DESIGNED TO REDUCE ENVIRONMENTAL IMPACTS

		Page
A.2.1	Required General Federal Measures	A2-2
A.2.2	Required Reclamation Procedures	A2-21
A.2.3	Chevron Standard Construction and Operation Procedures Designed to Reduce Environmental Impacts	A2-27

A2.1 REQUIRED GENERAL FEDERAL MEASURES

As a condition for granting the various rights-of-way and permits, the authorizing agencies will require that certain terms and conditions be met. The general federal measures are presented in this appendix. As project plans are finalized and before authorizations are given, specific requirements will be added by the various authorizing agencies.

Chevron will be required to prepare a Construction Operation (CO) plan or similar document, covering the construction of all project facilities on federal land. This plan will be submitted to the authorizing agencies for approval prior to commencement of work on the ground. The CO plan will contain site-specific stipulations for the following sections (because the various rights-of-way will involve many types of terrain, soils, vegetation, land uses, and climatic conditions, the sections within the CO plan will include sets of techniques and measures tailored to each condition encountered):

- Fire Protection
- Clearing—Visual Resources
- Erosion Control, Revegetation, and Restoration. Specific requirements for erosion control, revegetation, and restoration to be incorporated in the CO plan are included in the Required Reclamation Procedures section of this appendix.
- Transportation
- Communications
- Cultural Resources
- Threatened and Endangered Plant and Animal Species Studies and Mitigation, including a wildlife mitigation plan developed jointly by the State Wildlife Agency (Utah Division of Wildlife Resources and the Wyoming Game and Fish Department), Bureau of Land Management (BLM), U.S. Forest Service, U.S. Fish and Wildlife Service, and Chevron.
- Blasting
- Pesticide and Herbicide Use
- Health and Safety
  - Solid Waste
  - Emergency Response
  - Air Quality Transportation

Technical assistance and approval of written plans for federally managed lands will be obtained from the BLM and Forest Service prior to any construction.

Under authority of Section 504 of the Federal Land Policy and Management Act, Chevron will be required to provide funding to the appropriate federal agencies for the purpose of financing one or more specialists for administration of construction activities.

The following federal general and resource measures will be required for those portions of the project applicable to each agency.

A2.1.1 Bureau of Land Management

General Measures

1. There will be compliance with all state and federal regulations and laws.

2. All activities associated with the project will be conducted in a manner that will avoid or minimize degradation of air, land, and water quality. In the construction, operation, maintenance, and abandonment of the projects, activities will be performed in accordance with applicable air and water quality standards, and related plans of implementation, including but not limited to, the Clean Air Act, as amended (42 USC 1321) and the Clean Water Act (USCA 1251).

3. Permittees and other regular users of public lands affected by construction of the projects will be notified in advance of any construction activity that may affect their businesses or operations. This will include, but not be limited to, signing of temporary road closures, and notification of proposed removal and/or cutting of fences, and disturbances to range improvements or other use-related structures.

4. Chevron (holder) agrees not to exclude any person from participating in employment or procurement activities connected with the grant on the grounds of race, creed, color, national origin, and sex, and to ensure against such exclusions. Chevron (holder) further agrees to develop and submit to the proper reviewing official, specific goals and timetables with respect to minority and female participation in employment and procurement activity connected with this grant. Chevron (holder) will take affirmative action to utilize business enterprises owned and controlled by minorities or women in its procurement practices connected with this grant. Affirmative action will be taken by Chevron (holder) to assure full consideration to all minority or women applicants regarding employment opportunities connected with this grant. Chevron (holder) also agrees to post its equal opportunity obligations in conspicuous places on its premises to ensure availability to contractors, subcontractors, employees, and other interested individuals, such as bidders, contractors, purchasers, and labor unions or representatives, or workers with whom it has collective bargaining agreements.

5. The right-of-way grant will be issued subject to applicable regulations in 43 CFR Part 2800 and all valid rights existing on the date of this grant.

6. This right-of-way grant may be renewed. If renewed, the grant for right-of-way will be subject to regulations existing at the time of renewal and such other terms and conditions deemed necessary to protect the public interest.

7. The holder shall indemnify the United States against any liability for damage to life or property arising from the use and occupancy of BLM administered lands under the right-of-way.

8. There is hereby reserved to the Secretary of the Interior or his lawful delegate, the right to grant additional rights-of-way or permits 55 for compatible uses on, over, under, or adjacent to the land involved in the grant.

9. The right-of-way shall be limited to a total disturbed area, including existing roadways of no more than 50 feet wide, except where authorized for special areas by the authorizing agency (e.g., staging areas sidehill cuts, etc.

10. Holder shall conduct all snow removal and snow berm construction on areas outside of the right-of-way or on revegetated areas in a manner which will not disturb the surface of the ground. To prevent any surface disturbance, all equipment used for snow removal operations shall be equipped with shoes to keep the blade 6 inches above the ground. Holder shall take special precautions where the surface of the ground is uneven and at all drainage crossings to ensure that equipment blades do not touch the ground surface.

11. During the final survey of the pipeline, the centerline and outside boundaries of the pipeline will be staked and flagged. Stakes will be no more than 200 yards apart. Station numbers of the survey will be written on each stake or hub. Where the pipeline parallels an existing line, the existing line will be flagged where necessary to avoid disturbance of the existing line. The authorized officer reserves the right to make adjustments in right-of-way alignment as may be necessary to minimize environmental impacts.

12. The holder shall, at all times during construction, maintenance, and operation, maintain satisfactory spark arrestors on all steam and internal combustion engines and on all flues used in operations under this grant.

13. Holder shall furnish the authorized officer with engineering drawings of the existing ground profile and plan, and profile views of the facilities to be constructed under this right-of-way grant. These drawings must portray typical cross sections (i.e., cut, fill, bench sections, etc.) at representative points along or within the right-of-way.

14. Paved roads and railroads will be crossed by boring under the roadbed. Casing pipe will be installed when crossing under major roads and railroads.

15. After the ditch is prepared, the pipe will be positioned, welded, and laid in accordance with industry-approved methods. The pipe will be inspected visually and by x-ray cameras before it is buried.

16. Abandonment procedures will be submitted to the authorized officer at least 1 year prior to actual termination of abandonment.

17. Non-specular conductors, insulators, and hardware shall be used for electric power transmission lines, microwave towers, antennas, and reflectors.

18. The holder shall install and use Federal Communication Commission approved radio equipment in such a way that it will not interfere with the operation of other users' equipment. If, however, there is a radio or electronic interference with other users' operation which is traceable to the grantee's equipment, the holder shall immediately make such modifications to its equipment as shall eliminate the cause of interference at no cost to BLM, or grantee will discontinue use of said equipment until cause of interference has been eliminated.

19. An *"as built"* survey map will be submitted to the authorized officer(s) within 60 days after construction is completed.

20. When all development and rehabilitation have been completed, a joint compliance check of the right-of-way shall be made by the holder and the authorized officer or designated representative to determine compliance with the terms and conditions of the grant. Holder shall perform, at its own expense, any required modifications or additional reclamation work for compliance with the terms of the grant.

Resource Measures

1. Transportation

a. A transportation plan will be submitted as part of the CO plan. This plan will cover approval of temporary, reconstructed, and newly constructed roads and will include clearing work, signing, rehabilitation, and uses associated with transportation needs. Overland access could be specified in lieu of road construction or reconstruction.

b. Access roads necessary for operation and maintenance of the project will be clearly identified. Some of these access roads may be designated by the authorizing agency as open for public use, including but not limited to, off-road vehicular travel.

c. All roads constructed or improved shall be limited to a 16- to 18-foot wide driving surface excluding turnouts. (Turnouts, if necessary, are to be placed where designated on the map submitted with the right-of-way grant, or discussed and agreed upon during the presite inspection.) All roads shall be constructed as crowned and ditched roads and adequately drained. Drainage facilities may include ditches, water bars, culverts, and/or any other measure deemed necessary by the BLM authorized officer. Minimum authorized culvert diameter will be 18 inches. Culvert(s) of the diameter capable of handling the anticipated runoff are to be installed.

Culvert(s) will be installed at the location(s) discussed at the presite inspection or as indicated on the map submitted with the right-of-way grant.

d. Helicopters will be used at the discretion of the authorized officer where determined through consultation with Chevron that in order to string pipe and deliver equipment in areas where access to the terrain or management constraints preclude standard construction procedures.

e. The rights-of-way will be used as access roads only when necessary and during the construction period and only during emergencies after completion. Any use will be only as approved by the authorized officer.

f. Chevron will control off-road vehicular use on the rights-of- way. Such specified control could include use of physical barriers, replanting trees, or other reasonable means of off-road vehicular control.

g. Gates or cattle guards on established roads on public land will not be locked or closed by Chevron (unless the gates or cattle guards were originally locked or closed).

h. Construction in Jesse Ewing Canyon will be limited to the period between Labor Day and the opening of the general hunting season.

2. Land Use

a. Disturbance of improvements such as fences, roads, and watering facilities during the construction and maintenance of the rights-of-way must be kept to an absolute minimum. Immediate restoration of any damage to improvements to at least their former state will be required. Functional use of these improvements must be maintained at all times. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. A gate acceptable to the authorized officer shall be installed in the gate opening and kept closed when not in actual use. Where a permanent road is to be constructed or maintained, cattle guards shall be placed at all fence crossings.

b. If a natural barrier used for livestock control is broken during construction, Chevron will adequately fence the area to prevent drift of livestock. In pronghorn ranges, the fence may have to be constructed in a manner which allows for animal passage. Fence specifications will be determined on a case-by-case basis.

c. All fencing constructed by Chevron will meet BLM and Wyoming Game and Fish Department design requirements, except where total exclusion is required.

3. Water

a. All river, stream, and wash crossings required for access to project facilities will be at existing roads or bridges, except at locations designated by the authorized officer. Culverts or bridges will be installed at points where new permanent access roads cross live streams to allow fish unobstructed passage. Where temporary roads cross drainages or dirt fills, culverts will be installed during construction and removed upon completion of the project. Any construction activity in a perennial stream is prohibited unless specifically allowed by the authorized officer. All stream channels and washes will be returned to their natural state.

b. Construction plans for stream crossings by boring, driving, culverts, bridges, or trenching will be approved by the authorized officer.

c. Construction equipment will be refueled and maintained outside of stream channels in areas designated by the authorized officer.

d. Stream and river crossings will require more specialized equipment. Draglines or backhoes will be used to ditch streams or rivers. If necessary, after proper temporary use permitting, a staging area will be built to give the equipment a platform from which to operate. The staging area will also be used to prepare the pipe prior to placement in the ditch. Streams and rivers will be crossed when water levels are low in order to minimize damage to the streambed and adjacent areas. Special pipe coating and/or river weights will be applied prior to submerging and burying the pipe.

e. In order to minimize damage in the Red Creek Basin Watershed and areas with severe winter conditions, construction activity will be allowed only from May 15 to November 1. This limitation does not apply to maintenance and operation of this right-of-way. Any exception to this requirement must be obtained in writing from the authorized officer.

4. Waste

a. Garbage and other refuse will be stored in containers at all times and disposed of at least once a week in an authorized county-approved sanitary site or landfill. Used engine oil which is changed on federal lands will be stored in suitable containers and disposed of as refuse; no fuel, oil, or other hydrocarbon spills are permitted. If such a spill accidentally occurs, the authorized officer will be notified immediately and corrective measures undertaken as directed.

b. Within 30 days after conclusion of construction and operation, all construction materials and related litter and debris shall be disposed of in accordance with instructions from the authorized officer.

5. Vegetation

a. Vegetation cleared during construction or other activity will be disposed of in accordance with instructions from the authorized officer.

b. Commercial tree species which have been cut will be measured and remunerated.

c. Disturbed areas, which in the opinion of the authorizing agency are unsuitable for successful revegetation, shall be protected under the erosion control, revegetation, and reclamation provisions of the CO plan. This plan shall state the method of protection to be used and the provisions for prevention of site deterioration and introduction of noxious weeds. At a minimum, the CO plan will include the items described in the Required Reclamation Procedures section of this appendix for use on all rights-of-way on federally managed lands.

d. All trees will be cut so that stumps are no more than 6 inches high. The trees will be limbed and stacked adjacent to the right-of-way. During cleanup, all slash will be spread over the right-of-way.

e. Preclearing of mountain brush and tree-covered areas prior to dozer and maintenance blade work will be required. Preclearing will involve hand cutting brush and trees and removing them to designated areas.

f. The clearing of timber to reduce fire hazard will be limited to the right-of-way.

g. Fire control provisions will be included in the CO plan. Chevron shall do everything reasonably possible, both independently and upon request of the authorized officer, to prevent and suppress fires on or in the immediate vicinity of the right-of-way or permit area. This includes making available such construction and maintenance crews as may be reasonably obtained for the suppression of fires.

6. Soils

a. Existing soils and geological data shall be gathered by Chevron and used to achieve maximum revegetation and minimum soil erosion.

b. Areas subject to mudflows, landslides, mudslides, avalanches, rock falls, and other types of mass movement will be avoided where practical for locating linear facilities. Where avoidance is not practical, the design, based upon detailed field investigations and analyses, will provide measures to prevent the occurrence of mass movements.

c. In areas where soil surface has been modified or natural vegetation has been removed, noxious weeds will be controlled.

d. Watering of major access roads or other approved dust abatement procedures will be done to prevent severe wind erosion and loss of soil materials during construction.

e. The holder will reclaim the surface of the pipeline right-of-way to conform with adjacent terrain by replacing fills in the original cuts, replacing soil material, watering bars, and revegetating the surface.

7. Visual

a. A plan to minimize visual impacts from structures will be required as a part of the CO plan. Chevron will design and locate the pipeline routes and ancillary structures to blend into the existing environment so as to meet the minimum degree of contrast acceptable for the Visual Resources Management class and Visual Quality Objectives in which the structures would be located. The authorized officer will evaluate and approve measures before construction begins.

b. The edges of vegetative clearings in selected areas of dense shrubs and trees will be thinned and/or irregularly corrugated to avoid straight line visual effects.

c. Holder shall paint all permanent structures (on site for a period longer than 90 days after construction) a flat, noncontrasting color that is harmonious with the adjacent landscape. Exceptions to this requirement would be small structures that are not readily visible from a distance of approximately 0.25 mile (such as a wire or small pipe structures which require safety coloration in accordance with Occupational Safety and Health Administration requirements).

d. All facilities constructed under this right-of-way shall have matte or nonreflective finishes that harmonize with the adjacent natural setting. Nonreflective conductor cable and conductor support structures will be used throughout the length of the power transmission line.

8. Cultural

a. Prior to project construction, Chevron, in consultation with the authorized officer and the Wyoming and Utah State Historic Preservation Offices, will use available cultural resource data to develop a plan to locate cultural resources which would be directly affected by the proposed project through use of a BLM Class III field survey. The inventory plan will define the extent and intensity of the site-specific cultural resource surveys. Resources identified during the field surveys will be evaluated in terms of eligibility for nomination to the National Register of Historic Places.

b. Chevron will provide an approved archaeologist to execute or monitor the survey for cultural resources during construction of all project facilities.

c. All significant cultural resources identified within the project area will be avoided wherever possible. For significant cultural resources that cannot be avoided, a Memorandum of Agreement with the Advisory Council of Historic Preservation and the Wyoming and Utah State Historic Preservation Offices will be developed that details specific mitigation measures in accordance with 36 CFR 800. All cultural resources discovered during construction that were not previously identified will be left undisturbed until they can be evaluated for significance.

d. The archaeologist will notify the BLM authorized officer a minimum of 3 working days before beginning site monitoring. Construction methods will be used which allow the archaeologist to identify buried cultural resources without endangering the personnel who are monitoring the surface disturbance. If any potentially significant buried resources are identified and the archaeologist determines that further operations will seriously affect the cultural resources, work will be suspended, and BLM will evaluate the resource and develop additional stipulations as needed. The cost for avoidance or salvage of any cultural resources identified by the archaeologist will be that of the operator. A report of all activities of the archaeologist will be submitted to BLM within 30 days following completion of the monitoring.

e. The authorized officer(s) may require the holder to relocate the proposed pipeline in order to avoid destruction of archaeological, paleontological, or historical values, or to delay construction until salvage operations are completed. All salvage shall remain the property of the United States and shall be turned over to the BLM.

9. Paleontology

Chevron will provide a qualified paleontologist who is approved by the authorized officer. The paleontologist will conduct an intensive survey of all areas to be disturbed according to the significance and mitigation needs specified by BLM. The paleontologist will be available, as needed, during surface disturbance. If, in the opinion of the paleontologist, paleontological values specified by BLM would be disturbed, construction will be halted until appropriate action can be taken.

10. Wildlife

a. Chevron will allocate sufficient funds and time in advance of construction of any element of the project and its related facilities in order to perform U.S. Fish and Wildlife Service approved inventories on any Threatened and Endangered listed species determined by the U.S. Fish and Wildlife Service Biological Opinion. If it is determined that listed species or their habitats may be present and could be affected by the proposal, appropriate consultation with the U.S. Fish and Wildlife Service will be conducted by the federal authorizing agency. No activities will be authorized until consultation is complete as specified by Section 7(c) of the Endangered Species Act. The Biological Opinion issued by the Fish and Wildlife Service as a result of the consultation process will specify the specific mitigation measures to be carried out by Chevron.

b. Any active golden or bald eagle nest found within a 1-mile radius of project activities (especially along the Green River during winter nesting periods) would have to be protected from harassment during the critical nesting period (March 1 through June 30) in accordance with provisions established by the Bald Eagle Protection Act.

c. Chevron shall comply with existing county, state, and federal laws concerned with the protection and preservation of feral horses, feral burros, raptors, and game and non-game wildlife species.

d. In order to protect big game winter range and prevent harassment to wildlife during the critical winter period, construction activity will be allowed only from April 1 to December 15. This limitation does not apply to maintenance and operation of this right-of-way. Any exceptions to this requirement must be obtained in writing from the authorized officer.

e. In order to protect raptor nesting areas, construction activity will be allowed only from July 1 to March 1. This limitation does not apply to maintenance and operation along this right-of-way. Any exceptions to this requirement must be obtained in writing from the authorized officer.

f. No occupancy or other surface disturbance will be allowed within 2 miles from the center of a sage grouse strutting ground (lek) from March 1 through June 30 unless permitted by the authorized officer.

g. Pole top designs shall be raptor safe as per **Suggested Practices for Raptor Protection on Powerlines** for power transmission lines (Olendorff 1981).

h. No construction activity will be authorized at the Green River crossing in T. 1 N., R. 25 E., between September 15 and March 1 due to brown trout spawning and incubation.

i. Construction in Red Creek Canyon will be authorized only from July 15 to September 15 to avoid peak runoff periods, unless otherwise approved by the authorizing officer.

A2.1.2 U.S. Forest Service

General Measures

1. The permittee shall do everything reasonably within its power and shall require its employees, contractors, and employees of contractors to do everything reasonably within their power, both independently and upon request of the Forest Service, to prevent and suppress fires on or near the lands to be occupied under the conditions of this permit.

2. All earth cut or fill slopes favorable to revegetation, or other areas on which ground cover is destroyed in the course of construction, will be revegetated to grasses or other suitable vegetation as required by the Forest Supervisor.

3. Seeding or planting will be done at a time of the year, in a manner, and with species which the District Ranger considers offer the best chance of success, and will be repeated annually until such areas are accepted in writing by the District Ranger as being satisfactorily revegetated and stabilized.

4. The permittee shall be responsible for the prevention and control of soil erosion and gullying on the area designated by this permit and lands adjacent thereto, resulting from construction or operation of the permitted use, and shall provide preventive measures as required by the District Ranger.

5. No wastes or byproducts shall be discharged if they contain any substances in concentrations which will result in substantial harm to fish and wildlife or to human water supplies.

Storage facilities for materials capable of causing water pollution that would result in substantial harm to fish and wildlife or to human water supplies, shall be located so as to prevent any accidental spillage into waters or channels leading into water.

6. The power transmission lines shall be designed and constructed in accordance with accepted standards and specifications for power transmission lines of similar voltage, capacity, and purpose. The permittee shall place and maintain suitable structures and devices to reduce to a reasonable degree, the liability of contact between its power transmission line and telegraph, telephone, signal, or other power transmission lines heretofore constructed and now owned by the permittee, and shall also place and maintain suitable structures and devices to reduce to a reasonable degree, the liability of any structures or wires falling and obstructing traffic or endangering life on highways or roads, in a manner that is satisfactory to the Forest Service. All transmission lines will be buried within the Flaming Gorge NRA boundaries.

7. Natural phenomenons which occur on national forest land, such as avalanches, rising waters, high winds, falling limbs or trees, and other hazards, present risks to the permittee's property which the permittee assumes. The permittee has the responsibility of inspecting the site, right-of-way, and immediate adjoining area for dangerous trees, hanging limbs, and other evidence of hazardous conditions and, after securing permission from the Forest Service, of removing such hazards in order to protect the permittee's improvements.

8. The permittee shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of national forest lands under the conditions of this permit.

9. The permittee shall be held liable for all injury, loss, or damage, including fire suppression costs, directly or indirectly resulting from or caused by the permittee's use and occupancy of the area covered by the conditions of this permit, regardless of whether the permittee is negligent or otherwise at fault, provided that the maximum liability without fault shall not exceed $1,000,000 for any one occurrence, and provided further that the permittee shall not be liable when such injury, loss, or damage results wholly, or in part, from a negligent act of the United States, or an act of a third party not involving the facilities of the permittee.

Liability for injury, loss, or damage, including fire suppression costs in excess of the specified maximumm, shall be determined by the laws governing ordinary negligence.

10. The permittee shall perform all work with explosives in such a manner as not to endanger life or property. All storage places for explosives and flammable material shall be marked ***"DANGEROUS."*** The method of storing and handling explosives and flammable materials shall conform to recommended procedures contained in the *"Blasters Handbook"* published by E.I. du Pont de Nemours and Company, and in all federal, state, and local laws and regulations.

11. The permittee shall take reasonable precautions to protect, in place, all public land survey monuments, private property corners, and national forest boundary markers. In the event that any such land markers or monuments are destroyed in the exercise of the privileges authorized by this permit, depending upon the type of monument destroyed, the permittee shall see that they are reestablished or referenced in accordance with (1) the procedures outlined in the *"Manual of Instructions for the Survey of the Public Land of the United States,"* (2) the specifications of the county surveyor, or (3) the specifications of the Forest Service.

Further, the permittee shall cause such official survey records as are affected to be amended as provided by law.

12. This permit is issued on the condition that the permittee has secured, or will secure, the consent of any person having valid claim to the land.

13. This permit shall not be exclusive. The Forest Service reserves the right to use or permit others to use any part of the permitted area for any purpose, provided such use does not interfere with the rights and privileges hereby authorized.

14. No signs or advertising devices shall be erected on the area designated by this permit or highways leading thereto, without prior approval by the Forest Service as to location, design, size, color, and message. Erected signs shall meet neat and presentable standards and be maintained or renewed as necessary.

Resource Measures

1. Air Quality The applicant will conduct all activities associated with the project in a manner that will avoid or minimize degradation of air, land, and water quality. In the construction, operation, maintenance, and abandonment of the project, the applicant will perform its activities in accordance with applicable air and water quality standards related facility siting standards, and

related plans of implementation, including but not limited to the Clean Air Act, as amended (43 USC 1321). (Also applies to Water and Soil Resource Mitigation.)

2. Water In an attempt to reduce the amount of sediment which enters the streams or to reduce the impact of sediment which is disturbed within the streams, Chevron will apply the following guidelines.

a. When crossing streams within the pipeline right-of-way, streams will be crossed by vehicles only at the pipeline crossing.

b. A buffer strip of terrestrial vegetation will be left between staging areas adjacent to the stream and the stream itself. Riparian vegetation will not be counted upon as a buffer strip because silt collected by the riparian vegetation might enter the stream during high water periods.

c. Chevron will time the construction of the stream crossings to coincide with low flows. The stream(s) would have less capability for carrying sediment with less volume of water and slower velocities.

d. Chevron will complete the work as quickly as possible and return the stream to its natural state soon after the pipe is laid.

e. Backfill material for the pipe in the streambed will be of predominantly coarse material because fines would be washed away during placement.

f. The banks of the streams will be returned, as nearly as possible, to their original condition.

g. Construction across streams by boring or trenching will be specified by the authorized officer on a case-by-case basis.

h. When providing temporary access to the pipeline right-of-way, all rivers, streams, and washes will be crossed at existing roads or bridges, except at locations designated by the authorized officer. Where drainages would be crossed by temporary roads, dirt fills or culverts or low water crossings will be placed and removed upon completion of the project. Any construction activity in a perennial stream will be prohibited unless specifically allowed by the authorized officer. All stream channels and washes will be returned to their natural state. Such construction, when it would occur on national forest land, will be managed under the restrictions in the Forest Service and Department of Agriculture Policy Statement No. 2019, dated July 8, 1980. (Also applies to wildlife resource mitigation.)

i. Construction equipment will be refueled and maintained outside of stream channels in areas designated by the authorized officer.

3. Vegetation

a. Chevron will control noxious weeds in areas where soil surface has been modified or natural vegetation has been removed. Noxious weeds will be controlled in areas designated by the authorized officer.

b. On areas which would be cleared of vegetation by construction or other activity associated with this project, vegetation will be reestablished under the direction of the office in charge. Vegetation cleared during construction will be disposed of per authorizing agency direction. Where commercial tree species are cut, the trees will be cut, measured, and commercially sold per direction of the authorized officer.

c. Clearing in timbered areas to reduce fire hazard will be limited to the working space right-of-way.

d. The authorized officer will require preclearing of mountain brush and tree-covered areas prior to dozer or maintenance blade work. Preclearing will involve the hand cutting of brush and trees and removal by proper equipment to designated areas.

e. The reestablishment of vegetative cover, as well as watershed stabilization measures, will have the requirement of completion during the ongoing working season and prior to the next winter season.

f. Trees and brush (indigenous species) will be established according to the revegetation and rehabilitation plan contained within the construction and operation plan.

g. Disturbed areas, which in the opinion of the authorizing agency are unsuitable for successful revegetation, will be protected under the provisions of an approved reclamation, erosion control, and revegetation plan. This plan will state the method of protection to be used and the provisions for prevention of site deterioration and introduction of noxious weeds. At a minimum, the reclamation, erosion control, and revegetation plan including the items described in this appendix will be required for Forest Service rights-of-way. Prior to disturbance, this plan will be submitted to the authorizing agency for approval.

4. Soils

a. Existing soils and geological data will be gathered and used to achieve maximum revegetation and soil erosion mitigation responses.

b. Removal and stockpiling of topsoil will be required at all construction sites unless otherwise directed.

c. All topsoil will be conserved for reclamation requirements; excess topsoil will be stockpiled at designated locations.

d. Areas subject to mudflows, landslides, avalanches, rock falls, and other types of mass movement will be avoided where practical in locating the linear facilities. Where such avoidance is not practical, the design, based upon detailed field investigations and analyses, will provide measures to prevent the occurrence of mass movement.

5. Wildlife

a. Under the terms of the Endangered Species Act of 1973, Chevron will conduct surveys to determine if listed species or their habitats might be present on areas to be disturbed by any of the alternatives, regardless of land ownership. If it is determined that listed species or their habitats might be present and could be affected by the proposals, appropriate consultations with the U.S. Fish and Wildlife Service will be conducted by the federal authorizing agency. No activities will be authorized until consultation is complete as specified by Section 7(c) of the consultation process which would specify the specific mitigation measures to be carried out by Chevron.

b. Any active golden eagle nest found within 1 mile of project activities will be protected from harassment during the critical nesting period because of provisions established by the Bald Eagle Protection Act which requires protection of the golden eagle and its nests.

6. Agriculture

a. Permittees and other regular users of public lands and national forest lands which would be affected by construction of the project will be notified in advance of any construction activity that could affect their businesses or operations. This will include, but not be limited to, signing of temporary road closures, removal and/or cutting of fences, disturbances to range improvements, or other range use-related structures. (Also applies to Land Uses.)

b. If a natural barrier used for livestock control is broken during construction, Chevron will adequately fence the area to prevent drift of livestock. Fence specifications will be determined on a case-by-case basis.

c. Gates or cattle guards on established roads will not be locked or closed by Chevron.

7. Transportation

a. A transportation plan will be submitted for review and approval by the Forest Service. This plan will cover approval of temporary, reconstructed, and newly constructed roads and will include clearing work, rehabilitation, and uses associated with transportation needs. Overland access could be specific in lieu of road construction or reconstruction.

b. Access roads necessary for operation and maintenance of the phosphate slurry pipeline will be clearly identified. Some of these access roads would ostensibly be open for public use including, but not limited to, off-road vechicular travel.

c. Where possible, the right-of-way itself will be used as an access road only during the construction period. The authorized officer will require that the access roads paralleling this pipeline be closed and vegetative cover reestablished. No maintenance roads along the pipeline route will be permitted. (Any other roads providing access to the pipeline will be restricted by the provisions in Item 7a.)

8. Recreation

The Forest Service will direct Chevron to control off-road vehicular use on the right-of-way. Such specified control could include use of physical barriers, replanting of trees, or other reasonable means of vehicle control. Construction of the crossing at Little Hole Campground would be allowed only between Labor Day and the opening of the general hunting season.

9. Cultural

All significant cultural resources identified on any proposed project area will be avoided wherever possible. For those significant cultural resources that could not be avoided, a Memorandum of Agreement with the Advisory Council of Historic Preservation and the State Historic Preservation Office will be developed that details specific mitigation measures in accordance with 36 CFR 800. Discovery of any cultural resources during construction that were not previously identified will be reported immediately to the Ashley National Forest Supervisor and left undisturbed until they can be evaluated for significance.

10. Visual

a. The edges of vegetative clearings in selected areas of dense shrubs and trees will be thinned and/or irregularly corrugated to avoid straight line visual effects.

b. A plan to minimize visual impacts from pipeline right-of-way clearings and structures will be required. Chevron will prepare photographic simulations, as directed, of areas in which facilities were proposed within foreground/middleground areas of high scenic value or sensitivity. Using the simulation as a guide, Chevron will design and locate the pipeline routes and ancillary structures to blend into the existing environment. The authorizing agency will evaluate and approve measures before construction begins.

11. Paleontology

Chevron will provide a qualified paleontologist who would be approved by the authorized officer. The paleontologist will conduct an intensive survey of all areas to be disturbed according to the significance and mitigation needs outlined by the Forest Service. An approved paleontologist will be available, as needed, during surface disturbance. If the paleontologist determines that values will be disturbed, construction will be halted until appropriate action can be taken.

12. Land Uses

Disturbance of improvements such as fences, roads, and watering facilities during the construction and maintenance of the rights-of-way will be kept to an absolute minimum. Immediate restoration of any damage to improvements to at least their former state will be required. Functional use of these improvements will be maintained at all times.

When necessary to pass through a fence line, the fence will be braced on both sides of the passageway prior to cutting of the fence. A gate acceptable to the authorized officer will be installed in the gate opening and would be closed when not in actual use. Where a permanent road is to be constructed or maintained, cattleguards will be placed at all fence crossings. (Also applies to agriculture.)

13. Construction Techniques and Health and Safety

a. Helicopters will be used to string pipe and deliver equipment where determined through consultation with Chevron in areas where access to the terrain or management constraints preclude standard construction methods or where designated.

b. Garbage and other refuse will be disposed of in an authorized disposal site or landfill. Engine oil changed will be contained in suitable containers and disposed of as refuse; no fuel, oil, or other hydrocarbon spill will be permitted. If such a spill accidentally occurs, the contaminated soil will be excavated and the authorized officer notified immediately.

c.The authorized officer will establish right-of-way widths on a case-by-case basis.

d. Chevron will comply with applicable federal and state laws and regulations concerning the use of pesticides (i.e., insecticides, herbicides, fungicides, rodenticides, and other similar substances) in all activities and operations. Chevron will prepare a pesticide plan and obtain approval from the authorized officer prior to the use of such substances.

The plan will provide the type and quantity of material to be used; the pest, insect, fungus, etc., to be controlled; the method of application; the location of storage and disposals of containers; and other information the Forest Supervisor may require. The plan will be submitted no later than December 1 of any calendar year that covers the proposed activities for the next fiscal year (i.e., December 1, 1982, deadline for a fiscal year 1983 action). If the need for emergency use of pesticides is identified, the use will be approved by the Forest Supervisor. The use of substances on the rights-of-way and temporary permit areas will be in accordance with the approved plan. A pesticide will not be used if the Secretary of the Agriculture has prohibited its use. A pesticide will be used only in accordance with its registered uses and with other Secretarial limitations. Pesticides will not be permanently stored on national forest lands.

e. Within 30 days after construction and operation, all construction materials and related litter and debris will be disposed of in accordance with instruction from the authorized officer.

f. A fire control plan will be included in the construction and operation plan. Chevron will do everything reasonably possible, both independently and upon request of the authorized officer, to prevent and suppress fires on or in the immediate vicinity of the right-of-way or permit area. This will include making available such construction and maintenance force as might be reasonably obtained for the suppression of fires.

g. Within the Ashley National Forest, all disturbed areas (especially sidehill cuts) will be restored to near-natural conditions.

A2.1.3 U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers has prescribed management practices that should be followed, to the maximum extent practical, for discharges covered by the Nationwide Permit (items 1 through 8). Additionally, certain conditions (33 CFR 323.4-3(b)) must be met under the Nationwide Permit authority (items 9 through 16). For further detail, please refer to the U.S. Army Corps of Engineers Permit Program, *"A Guide for Applicants,"* November 1, 1977.

1. Discharges of dredged or fill material into United States water should be avoided or minimized through the use of other practical alternatives.

2. Discharges in spawning areas during spawning seasons should be avoided.

3. Discharges should not restrict or impede the movement of aquatic species indigenous to the waters, impede the passage of normal or expected high flows, or cause the relocation of the waters (unless the primary purpose of the fill is to impound water).

4. If the discharge creates an impoundment water, adverse impacts on the aquatic system caused by the accelerated passage of water and/or the restriction of its flow should be minimized.

5. Discharges in wetlands areas should be avoided.

6. Heavy equipment used in wetlands should be placed on mats.

7. Discharges into breeding and nesting areas for migratory waterfowl should be avoided.

8. All temporary fills should be removed in their entirety.

9. There cannot be any change in preconstruction bottom contours. (Excess material must be removed to an upland disposal area.)

10. The discharge cannot occur in the proximity of a public water supply intake structure.

11. The discharge cannot destroy a threatened or endangered species as identified under the Endangered Species Act nor endanger the critical habitat of such species.

12. The discharge cannot disrupt the movement of those aquatic species indigenous to the waterbody.

13. The discharge must consist of suitable material that is free of toxic pollutants in other than trace quantities.

14. The fill created by a discharge must be properly maintained to prevent erosion and other nonpoint sources of pollution.

15. The discharge must not occur in a component of the national wild and scenic river system or in a component of a state wild and scenic river system.

16. No access roads, fills, dikes, or other structures can be constructed below the ordinary high water of the streams specified under the Nationwide Permit. These structures would require separate section 404 permits.

A2.1.4 U.S. Environmental Protection Agency

1. Since construction of the slurry and water pipelines will involve river crossings, a Nationwide Section 404 Permit will be required. Generally river crossings are covered under the permit, although specific permits (Individual 404 and Section 10 permits) will be required for important crossings. An individual permit will be required if filling of any wetlands is involved. The U.S. Environmental Protection Agency reviews the applications for 404 permits administered by the U.S. Army Corps of Engineers and provides recommendations for action on the permit including mitigation measures. For this project, the U.S. Environmental Protection Agency will likely recommend the following measures regarding the Green River crossings:

a. Dredged materials should be stored away from the flowing waters;

b. Revegetation of disturbed wetland or riverine areas should utilize native trees, shrubs, and grasses where applicable;

c. The permit should consider appropriate times for river disturbance that do not interrupt spawning cycles of various fish species; this may involve identifying the optimal *"gaps"* or *"windows"* for construction between different spawning seasons.

Additional mitigation measures will be considered for the following areas after more details are received:

d. Provisions for backfillings;

e. Lengths of riprapping involved; perhaps some limitation to minimize use of riprap may be warranted.

2. The U.S. Environmental Protection Agency currently has jurisdication regarding permits for disposal of hazardous wastes. The project described here does not directly fall under any of the categorical industrial processes that would generate hazardous wastes identified in 40 CFR Part 261.32. Chevron should determine through Extraction Procedure (E.P.) Toxicity testing under Appendix II of the 40 CFR Part 261 regulations or other identified procedures whether any of the plant by-products, such as sludges or ash, constitute a hazardous waste.

A2.2 REQUIRED RECLAMATION AND EROSION CONTROL PROCEDURES

The following procedures will be required for use on federal land (BLM and Forest Service). Chevron has stated it would follow or has agreed to follow these procedures on all land (Chevron 1982a, b, c). These procedures will be followed on all federal land and on state and private lands as appropriate and agreed to by the landowner. The procedures outlined in this appendix will be incorporated as stipulations in any federal right-of-way grant that may be issued. These procedures will be applicable during all phases of the project (construction, operation, and abandonment).

1. When operating on Utah State land, Chevron will prepare and follow appropriate plans, including applicable measures and procedures, to accomplish and ensure successful reclamation of state land affected by project action, as required by the Utah State Department of Natural Resources, Division of Oil, Gas, and Mining (State of Utah 1953)

2. When operating on Wyoming State land, Chevron will prepare and follow appropriate erosion control and reclamation plans including applicable measures and procedures to accomplish and ensure successful reclamation of state land affected by project action as required by the Wyoming State Department of Environmental Quality, Land Quality Division, guidelines.

3. Chevron will comply with the erosion control and reclamation programs it has developed and will follow through on its commitment to *"comply with appropriate regulations and required plans and stipulations to protect and restore the land disturbed by project construction and operation to a stable, productive, and aesthetically acceptable condition."*

4. Chevron will develop a detailed, site-specific reclamation plan as part of its Operating Plan. Because the proposed rights-of-way are composed of many types of terrain, soils, vegetation, land uses, and climatic conditions, the detailed plan will include sets of techniques and measures tailored to each condition encountered. Local expertise and locally effective reclamation methods will be followed when the specific procedures for the detailed reclamation plan are developed. The erosion control, revegetation, and restoration guidelines and Operating Plan will be implemented under the direction of the authorized officer.

5. Detailed information regarding applicable techniques and technical assistance to private landowners concerning erosion control measures and reclamation procedures will be obtained where required by the private landowner from the Soil Conservation Service through local Soil Conservation Districts. Technical assistance and approval of written plans for

federal lands will be obtained from the BLM and the Forest Service prior to any construction.

6. During construction of Chevron's project, an on-site reclamation specialist will be employed by Chevron to provide: (a) liaison with private landowners, federal agency officials, and local governments; (b) expertise to direct applicable restoration procedures when special conditions are encountered, without causing construction delays; and (c) favorable public relations.

7. General erosion control and restoration measures have been developed for the following areas and will be included as part of the Operating Plan:

- Right-of-way and Site Clearing
- Trenching and Preservation of Topsoil
- Backfilling and Grading
- Land Preparation and Cultivation
- Revegetation
- Maintenance and Monitoring
- Use of Biochemicals

A2.2.1 Right-of-way and Site Clearing

Emphasis will be placed on protecting existing vegetation and minimizing disturbance of the existing environment.

- Land grading will be done only on the area required for construction.
- Sidehill cuts will be kept to a minimum to ensure resource protection and a safe and stable plane for efficient equipment use. The authorizing agency will provide assistance and will approve sidehill cuts prior to construction.
- Existing ground cover such as grasses, leaves, roots, brush, and tree trimmings will be cleared and piled only to the extent necessary. Slash will be piled and later shredded and chipped for use in restoration operations or disposed of at the discretion of the authorized officer.
- Trees and shrubs that are not cleared from the right-of-way will be protected from damage during construction.
- Where the right-of-way crosses streams and other water bodies, the banks will be stabilized to prevent erosion. Construction techniques will be designed to minimize damage to shorelines, recreational areas, and fish and wildlife habitat.
- A buffer strip of terrestrial vegetation above the high water line will be left between work staging areas adjacent to the stream and the stream itself.
- Care will be taken to avoid slurry spills and other types of pollution in all areas including streams and other water bodies and in their immediate drainage areas. Spills will be cleaned up as required by the authorized officer or landowner.
- Design and construction of all temporary roads will be based on an approved transportation plan and will ensure proper drainage, minimize soil erosion, and preserve topsoil. After abandonment, these roads will be closed and the areas restored without unnecessary delay or maintained at the discretion of the landowners. Restoration, including redistribution of topsoil, will be to the satisfaction of the landowner and/or regulatory officials.
- During wet and muddy weather conditions, as determined by the on-site reclamation specialist, the authorizing agency will issue stop and start orders to prevent rutting or excessive tracking of

soil and deterioration of vegetation in the right-of-way area.

- During construction activities near streams or lakes, sedimentation (detention) basins and/or straw bale filters will be constructed to prevent suspended sediments from reaching downstream watercourses or lakes, as required by the authorized officer.

- Actual construction activities will immediately follow clearing operations, especially in areas where soils are highly susceptible to wind or water erosion and other special areas.

A2.2.2 Trenching and Preservation of Topsoil

To facilitate complete project site reclamation, topsoil will be removed from disturbed land within the project area as necessary. Topsoil stockpiles within the plant complex will be mulched and seeded to reduce wind and water erosion.

Trenching methods and techniques would ensure that:

- Topsoil will be removed from the trench area by double-ditching (i.e., windrowed separately, protected, and replaced last during backfilling). This procedure will be followed as specified by the authorized officer.

- Remaining unearthed materials will be removed and stored in a manner that facilitates backfilling procedures, uses a minimum amount of right- of-way area, and protects the excavated material from vehicular and equipment traffic.

- Cofferdams or other diversionary techniques will be used where necessary to permit flow in one part of a stream while pipelaying construction occurs in another part.

- A specific trenching and excavated material stockpiling procedure will be used on steep-sloping and rough, broken terrain to ensure minimum disturbance as outlined in the Operating Plan. This procedure will be developed by both the authorized officer and Chevron.

A2.2.3 Backfilling and Grading

The following backfilling and grading techniques will be used.

- Backfill will be replaced in a sequence and density similar to the preconstruction soil condition.

- Backfilling operations will be conducted in a manner that would minimize further disturbance of vegetation.

- The contour of the ground will be restored to permit normal surface drainage.

- In steeply sloping and steep terrain, erosion control structures such as water bars, diversion channels, and terraces will be constructed to divert water away from the pipeline trench and reduce soil erosion along the right-of-way and other adjoining areas disturbed during construction.

- All structures such as terraces, levees, underground drainage systems, irrigation pipelines, and canals will be restored to preconstruction conditions so that they function as originally intended.

- The surface will be graded to conform to the existing surface of the adjoining areas except for a slight crown over the trench to compensate for natural subsidence. In cropland areas, especially border-and furrow-irrigated cropland, the soils will be compacted and the crown will be smoothed to match the bordering area and allow for surface irrigation.

- Topsoil will be uniformly replaced over the trench fill and other disturbed areas to restore productivity to preconstruction conditions.

- Materials unsuitable for backfilling or excess backfill material will be disposed of as arranged by the authorized officer(s).

- Temporary work space or staging areas used at stream and highway crossings and other special sites will be restored to approximate preconstruction conditions and to the satisfaction of the authorized officer(s).

- The rights-of-way used at stream crossings will be restored as nearly as possible to a preconstruction state soon after completion of construction. The upland areas and banks will be revegetated to preconstruction conditions; where this is not possible, they will be mulched with rock. The size of the rock mulch will be larger in diameter than materials excavated from the trench. The streambed will be returned to its original contours with sediments similar to those that were excavated and as approved by the authorized officer. All drainages crossed by the pipeline will be kept free of vegetative debris and channels will be reopened following construction operations.

- Areas in steep terrain or wet areas where the right-of-way must be graded at two elevations (two-toning) or diversion dams must be built to facilitate construction, will be contoured upon completion of construction to resemble the original grade as nearly as possible, as agreed to by the authorizing officier in consultation with Chevron.

A2.2.4 Land Preparation for Seeding and Cultivation

Construction, backfilling, and grading activities commonly cause compaction and alter soil conditions that affect soil productivity and/or seeding success in the right-of-way area. The following practices and techniques will be used to improve these soil conditions, protect soil from erosion, and provide a favorable seedbed:

- In cropland areas, as required by the authorizing agency or landowner, subsoiling or chiseling will be used to ensure that soil compaction is reduced and preconstruction soil permeability is restored.

- Chiseling will be used in rangeland areas to reduce compaction and improve soil permeability unless there are objections from the landowner or authorizing agency. Pitting and contour furrowing as directed by the authorizing agency or landowner will be done on disturbed areas with steeper slopes to increase infiltration and to reduce runoff and erosion.

- Suitable mulches and other soil stabilizing practices will be used on all regraded and topsoiled areas to protect unvegetated soil from wind and water erosion and to improve water absorption.

- Special mulching practices or matting will be necessary to protect seeding, seedlings after germination, and plantings in critical areas where wind and water are serious erosion hazards.

- Commercial fertilizers will be applied to soil areas with low inherent fertility to maintain crop yields and establish grass seedings. Application rates will be commensurate with annual precipitation and available irrigation water.

- Seedbeds for areas seeded to grass will be prepared so that they will provide a firm and friable condition suitable for the establishment of grass stands.

- Rock mulches will be used in steep-sloping rock outcrop areas and low precipitation areas to reduce erosion and promote vegetation growth.

- Cultivation and land preparation operations on steeply sloping areas will be done on the contour to minimize erosion.

- Soil areas with rock fragments such as very coarse gravel, cobble, or stone scattered on the surface will be restored to the original preconstruction surface condition to blend with the adjoining area, to avoid a smooth surface right-of-way area, and to control accelerated erosion.

A2.2.5 Revegetation (Reseeding and Planting)

All disturbed areas shall be reshaped and revegetated as nearly as possible to their original condition or to a condition agreed upon by both Chevron and the authorized officer. This reclamation shall be accomplished as soon as possible after the disturbance occurs. Revegetation efforts will be continued until a satisfactory vegetative cover is established. The following practices and techniques will be used in areas where reseeding is suitable, as determined by the authorizing agency:

- A firm seedbed will be prepared prior to seeding. This will include a mulch of plant residues or other suitable materials. A cover crop may be needed in larger disturbed areas.

- Seed will be planted by drilling, broadcasting, or hydroseeding. Wherever possible, planting will be done with a drill. Drill seeding with a grass drill equipped with depth bands will be used where topography and soil conditions allow operation of equipment to meet the seeding requirements of the species being planted. Broadcast seeding will be used in inaccessible or small areas. Seed will be covered by raking or harrowing. Hydroseeding will be done in critical areas as determined by the reclamation specialist or authorized officer.

- Only species adaptable to local soil and climatic conditions will be used; generally these would be native species. However, introduced species may be considered for specific conditions when approved by the landowner and regulatory authority. Seeding rates in critical area plantings and generally throughout the right-of-way will be increased 100 percent over regular seeding rates in order to compensate for seed mortality from adverse growing conditions.

- Seed testing will be conducted to meet federal, state, and agency seed requirements.

- Seeding will be done when seasonal or weather conditions are most favorable, and as determined by the landowner or authorized officer.

- Grazing or mowing will be delayed at least one season after seeding, especially in highly erodible areas, in order to provide time for vegetation to become established unless there are objections by the landowner or lessee. Protective fencing may be necessary in special areas as agreed upon and will be constructed, maintained, and removed according to authorizing agency or land owner specifications.

- In areas of low annual precipitation

(generally less than 8 to 10 inches) where reseeding is not suitable or as successful, erosion control structures and measures will be applied on sloping areas to reduce accelerated erosion and to allow reestablishment of preconstruction surface soil conditions and natural revegetation.

- Trees and shrubs will be reestablished in areas as specified in the revegetation plan. Temporary and/or permanent structures will be installed by Chevron at specific locations along the right-of-way and other disturbed sites to prevent off-road vehicle access.

Biochemicals

The use of biochemicals such as herbicides, fungicides, and fertilizers will comply with state and federal laws, regulations, and policies regarding the use of poisonous, hazardous, or persistent substances. State and federal wildlife agencies will be contacted if application of any of these substances will be on or near sensitive wildlife areas. Application of these substances will be by ground methods. Prior to the use of such substances on or near the permit or grant area, Chevron will obtain approval of a written plan for such use from the authorized officer, landowner, and/or appropriate wildlife agency. The plan will outline the kind of chemical, method of application, purpose of application, and other information as required, and will be considered as the authorized procedure for all applications until revoked by the authorized officer, landowner, and/or appropriate wildlife agency. This plan will become part of the Operating and Construction Plan.

A2.2.6 Maintenance and Monitoring

Joint inspection of the right-of-way by Chevron and the authorizing agency will be conducted in order to monitor the success and maintenance of erosion control measures and revegetation programs on native grazing land for two growing seasons; on private land, for a period determined by the landowner; or on state or federal land, by the authorized officer. The monitoring program will identify problem areas and corrective measures to ensure vegetation cover and erosion control. Certification of successful revegetation and erosion control will be determined by the landowner or authorized officer.

A2.3 CHEVRON STANDARD CONSTRUCTION AND OPERATION PROCEDURES DESIGNED TO REDUCE ENVIRONMENTAL IMPACTS

Chevron has stated tht the following procedures will be followed in the construction of the proposed Chevron Phosphate Project (Chevron 1982a, b, c).

A2.3.1 Construction Timing

1. Right-of-way construction will be scheduled to avoid critical wildlife habitats during primary use periods as identified in BLM Management Framework Plans and state wildlife agency recommendations.

2. Pipeline construction activities on irrigated cropland will be timed, as nearly as possible, in order to avoid disruption of irrigation delivery systems during the major irrigation season and to reduce effects on crop production in construction areas as well as adjoining irrigated cropland areas served by the systems.

3. Pipeline construction activities in narrow floodplain areas subject to high erosion hazards will be timed in order to avoid high water flows as much as possible, which will reduce the effects of construction on erosion and sedimentation.

A2.3.2 Construction Procedures

1. All solid construction wastes from the plant

site will be disposed of in the Sweetwater County sanitary landfill. Solid wastes from the rights-of-way will be disposed of in approved land fill sites. Sanitary wastes produced before completion of the wastewater treatment system will be handled by a contractor who will provide portable toilets.

2. Water trucks will moisten the work surfaces to suppress dust during construction of the plant complex.

3. Chevron will adhere to Occupational Safety and Health Administration rules and regulations during the construction and operation phases.

4. All culverts, bridges, and ditches will be designed to pass the appropriate peak runoff event. This will vary from a 10- to a 100-year event as needed.

5. The railroad spur will not be fenced (unless required by private landowners).

6. Clean water for hydrostatic testing will be used at the plant site and in all of the proposed pipelines. The water will not be discharged but will be stored at the plant site.

7. Where fences are encountered along the rights-of-way, adequate bracing will be installed at each edge of the right-of-way before cutting the wires and installing temporary gates. At the completion of construction, the opening will be closed using fencing of a quality equal to or greater than that of the original fencing.

8. Where blasting is necessary, Chevron will adhere to the following safety precautions in all instances.

- In areas of human use, shots will be blanketed (matted).
- Landowners or tenants in close proximity to the shot will be notified in advance so that livestock and other property can be adequately protected.
- Before detonation, a clearance will be made to ensure that construction personnel and local residents are removed from the blast area.

9. When required, materials for approaches and fill will be obtained from: (a) the right-of-way; (b) commerical sources (which would require transportion to the location); or (c) adjacent lands where permitted by the federal surface management agency or the landowner.

10. In remote areas where there are no existing access roads, the pipeline right-of-way will be the primary path of surface travel for pipeline construction. Generally, roadbeds supporting paved roadways will be crossed by boring beneath the bed and inserting casing pipe rather than by ditching across the surface.

11. Stream gradients will be maintained by removing all spoil from the bed upon completion of construction. Banks will be restored to resemble their original grade, and sand-cement sacks, breakers, or riprap will be placed over the pipeline where necessary.

12. The plant structures will be painted in natural tones, except where required for aircraft warning.

A2.3.3 Operation and Maintenance

1. Permanent access along the phosphate slurry pipeline right-of-way will not be maintained. Where existing roads or trails cannot be used for emergency access, temporary permits will be obtained.

2. Volatile fuels and reagents will be stored in closed tanks to minimize the escape of vapors into the atmosphere.

3. Many unit operations will be carried out within closed vessels or ventilated process equipment. The gasses from the vessels and equipment will be passed through scrubbers to remove mists, gaseous pollutants, and dust.

4. Storage tanks will be diked to contain spills and return effluents to the process circuits.

5. Instrumentation will be installed in all plant circuits to monitor and control the process. This instrumentation will significantly reduce the probability of an accidental release of effluents into the environment.

6. Water requirements for the project will be reduced by recirculating process water and using water from the phosphate slurry pipeline for process circuits.

7. Surface runoff from the plant site will be routed to the gypsum impoundment and used as process makeup water. This will prevent possible contamination of surface waters from this source.

8. If herbicides are required for suppression of weeds around project components, they will be applied in accordance with manufacturer's recommendations and in accordance with federal and state regulations.

9. The intersection of the plant access road with Wyoming State Highway 430 will have a left turn/storage lane, an acceleration/deceleration lane, and through-traffic lanes. If traffic should become a problem, shift staggering and busing will be considered as partial mitigation.

10. Railroad accidents with motor vehicles should not occur since there will be no grade crossings between the plant site and the main line. Should a rail accident create a spill of feed stock or products, the carrier will be responsible for calling the Chemical Transportation Emergency Center (Chemtrec) and for initiating cleanup procedures. Chemtrec will then notify Chevron who will have a trained staff on-call, 24 hours a day.

A2.3.4 Abandonment

1. Foundations will be broken and buried. Topsoil will be spread over disturbed areas. Mulch, at the rate of 2 tons per acre, will be spread over the topsoil and anchored with a crimping disc prior to seeding.

2. Seeding will occur after October 15 to utilize all available winter and spring moisture. Seeding will normally be done by drilling, but steep slopes and small areas may be seeded by manual broadcasting at twice the seed rates.

If broadcast, the seeds will be covered by dragging, chaining, raking, or by other means.

3. Impoundments and ponds will be allowed to evaporate before they are contoured to blend as well as possible with the surrounding topography. Topsoil used to reclaim the 400-acre gypsum impoundment will be stripped from adjacent areas at the time of reclamation, and impoundments will be mulched and seeded as previously described.

APPENDIX 3
LAND STATUS AND OWNERSHIP BY MILEPOST

TABLE A3-1
Proposed Action: Linear Facilities

MP to MP		Distance (Miles)	Landownership/Management
Power Transmission Line to the Plant			
0.0	0.7	0.7	Private
0.7	1.0	0.3	BLM
1.0	2.7	1.7	Private
2.7	3.7	1.0	BLM
3.7	4.7	1.0	Private
4.7	5.7	1.0	BLM
5.7	7.0	1.3	Private
Railroad Spur			
0.0	0.4	0.4	Private
0.4	1.5	1.1	BLM
1.5	1.6	0.1	Private
1.6	2.7	1.1	BLM
2.7	3.8	1.1	Private
3.8	4.0	0.2	BLM
4.0	5.1	1.1	Private
5.1	5.5	0.4	BLM
5.5	6.0	0.5	Private
6.0	7.2	1.2	BLM
7.2	8.4	1.2	Private
8.4	8.6	0.2	BLM
8.6	8.7	0.1	Private
County Road Relocation			
0.0	1.4	1.4	Private
1.4	1.6	0.2	BLM
David Bottom			
Plant Process Water Supply Pipeline			
0.0	3.4	3.4	Private
3.4	4.3	0.9	BLM
4.3	5.6	1.3	Private
5.6	6.8	1.2	BLM
6.8	9.0	2.2	Private
9.0	10.1	1.1	BLM

TABLE A3-1
Proposed Action: Linear Facilities (continued)

MP to MP		Distance (Miles)	Landownership/Management
10.1	11.1	1.0	Private
11.1	12.1	1.0	BLM
12.1	12.4	0.3	Private
12.4	13.2	0.8	BLM
13.2	14.3	1.1	Private
Plant Process Water Supply Pipeline			
14.3	15.4	1.1	BLM
15.4	15.7	0.3	Private
15.7	16.2	0.5	State of Wyoming
16.2	16.4	0.2	Forest Service
Access Road			
0.0	2.3	2.3	Private
2.3	4.8	2.5	BLM
4.8	5.0	0.2	Forest Service
Power Transmission Line			
0.0	1.0	1.0	Private
1.0	3.0	2.0	BLM
3.0	4.0	1.0	Private
4.0	5.0	1.0	BLM
5.0	6.0	1.0	Private
6.0	7.0	1.0	BLM
7.0	8.0	1.0	Private
8.0	9.0	1.0	BLM
9.0	9.8	0.8	State of Wyoming
9.8	10.8	0.2	Forest Service
Red Creek Canyon Phosphate Slurry Pipeline			
Segment A			
0.0	1.2	1.2	Private
1.2	5.6	4.4	BLM
5.6	7.0	1.4	Private
7.0	8.4	1.4	BLM
8.4	16.8	8.4	Private
16.8	19.6	2.8	BLM
19.6	27.4	7.8	Private
27.4	28.7	1.3	BLM
28.7	29.2	0.5	State of Utah

TABLE A3-1
Proposed Action: Linear Facilities (concluded)

MP to MP		Distance (Miles)	Landownership/Management
29.2	29.7	0.5	Private
29.7	30.3	0.6	State of Utah
30.3	36.0	5.7	BLM
36.0	36.1	0.1	Private
36.1	36.9	0.8	BLM
36.9	37.1	0.2	Private
37.1	45.3	8.2	BLM
45.3	45.5	0.2	Private
45.5	46.9	1.4	BLM
46.9	48.9	2.0	Private
48.9	49.9	1.0	BLM
49.9	50.4	0.5	Private
50.4	52.4	2.0	BLM
Segment B			
0.0	19.0	19.0	BLM
19.0	19.9	0.9	Private
19.9	20.0	0.1	BLM
20.0	21.0	1.0	Private
21.0	23.3	2.3	BLM
23.3	24.4	1.1	Private
24.4	25.4	1.0	BLM
25.4	26.5	1.1	Private
26.5	27.6	1.1	BLM
27.6	28.7	1.1	Private
28.7	29.5	0.8	BLM
29.5	30.6	1.1	Private
30.6	31.7	1.1	BLM
31.7	32.8	1.1	Private
32.8	33.8	1.0	BLM
33.8	34.8	1.0	Private
34.8	35.9	1.1	BLM
35.9	38.2	2.3	Private
38.2	39.4	1.2	BLM
39.4	40.7	1.3	Private
40.7	41.8	1.1	BLM
41.8	45.8	4.0	Private
Power Transmission Line			
0.0	0.5	0.5	BLM
0.5	1.5	1.0	State of Wyoming
1.5	7.5	6.0	BLM

TABLE A3-2
Proposed Action: Linear Facilities

MP to MP		Distance (Miles)	Landownership/Management
Middle Firehole Alternative			
Plant Process Water Pipeline			
0.0	3.4	3.4	Private
3.4	4.3	0.9	BLM
4.3	5.6	1.3	Private
5.6	6.8	1.2	BLM
6.8	9.0	2.2	Private
9.0	10.2	1.2	BLM
10.2	11.3	1.1	Private
11.3	11.4	0.1	BLM
11.4	12.3	0.9	Private
12.3	13.4	1.1	BLM
13.4	13.5	0.1	Private
13.5	14.6	1.1	BLM
14.6	15.5	0.9	Private
15.5	16.0	0.5	BLM
16.0	16.8	0.8	Private
16.8	18.1	1.3	BLM
18.1	19.2	1.1	Private
19.2	19.7	0.5	BLM
19.7	20.4	0.7	Forest Service
Access Road			
0.0	3.6	3.6	Private
3.6	7.3	3.7	BLM
7.3	8.0	0.7	Forest Service
Power Transmission Line			
0.0	1.0	1.0	Private
1.0	3.0	2.0	BLM
3.0	4.0	1.0	Private
4.0	5.0	1.0	BLM
5.0	6.0	1.0	Private
6.0	7.0	1.0	BLM
7.0	8.0	1.0	Private
8.0	9.0	1.0	BLM
9.0	10.0	1.0	Private
10.0	11.0	1.0	BLM
11.0	12.0	1.0	Private
12.0	13.3	1.3	BLM
13.3	14.0	0.7	Forest Service

TABLE A3-2
Proposed Action: Linear Facilities (continued)

MP to MP		Distance (Miles)	Landownership/Management
Jensen Alternative			
Water Supply Pipeline			
0.0	1.5	1.5	Private
1.5	6.5	5.0	BLM
6.5	7.5	1.0	State of Utah
7.5	14.5	7.0	BLM
14.5	15.2	0.7	State of Utah
15.2	17.7	2.5	BLM
17.7	19.0	1.3	Private
Power Transmission Line			
0.0	0.6	0.6	Private
MAPCO Alternative			
Segment A*			
0.0	1.2	1.2	Private
1.2	5.6	4.4	BLM
5.6	7.0	1.4	Private
7.0	8.4	1.4	BLM
8.4	16.8	8.4	Private
16.8	19.6	2.8	BLM
19.6	27.4	7.8	Private
27.4	28.7	1.3	BLM
28.7	29.2	0.5	State of Utah
29.2	29.7	0.5	Private
29.7	30.3	0.6	State of Utah
30.3	36.0	5.7	BLM
36.0	36.1	0.1	Private
36.1	36.9	0.8	BLM
36.9	37.1	0.2	Private
37.1	40.5	3.4	BLM
40.5	41.7	1.2	State of Utah
41.7	48.0	6.3	BLM
48.0	48.5	0.5	Private
48.5	50.5	2.0	BLM
Willow Creek			
Segment A*			
0.0	1.2	1.2	Private

TABLE A3-2
Proposed Action: Linear Facilities (concluded)

MP to MP		Distance (Miles)	Landownership/Management
1.2	5.6	4.4	BLM
5.6	7.0	1.4	Private
7.0	8.4	1.4	BLM
8.4	16.8	8.4	Private
16.8	19.6	2.8	BLM
19.6	27.4	7.8	Private
27.4	28.7	1.3	BLM
28.7	29.2	0.5	State of Utah
29.2	29.7	0.5	Private
29.7	30.3	0.6	State of Utah
30.3	41.1	10.8	BLM
41.1	42.2	1.1	State of Utah
42.2	48.5	6.3	BLM
48.5	49.0	0.5	Private
49.0	51.0	2.0	BLM
Northwest Alternative			
Segment A			
0.0	0.7	0.7	Private
0.7	5.6	4.9	BLM
5.6	18.6	13.0	Private
18.6	19.1	0.5	BLM
19.1	19.3	0.2	State of Utah
19.3	20.7	1.4	Private
20.7	21.1	0.4	Forest Service
21.1	22.0	0.9	Private
22.0	22.3	0.3	Forest Service
22.3	22.7	0.4	Private
22.7	24.1	1.4	Forest Service
24.1	24.2	0.1	BLM
24.2	25.5	0.3	Private
25.5	26.3	1.8	BLM
26.3	26.9	0.6	State of Utah
26.9	29.4	2.5	Forest Service NRA
29.4	31.4	2.0	Forest Service
31.4	31.8	0.4	Private
31.8	33.5	1.7	BLM
33.5	33.7	0.2	Private
33.7	34.0	0.3	BLM
34.0	34.3	0.3	Private
34.3	37.0	2.7	BLM
37.0	38.1	1.1	State of Wyoming
38.1	42.3	4.2	BLM

*Segment B is identical to the proposed action, Red Creek Canyon phosphate slurry pipeline.

APPENDIX 4
RESOURCE AND ISSUE AREA MAPS

Map A4-1	Rye Grass Draw Issue Area
Map A4-2	Red Creek Canyon Issue Area
Map A4-3	Red Creek Basin Escarpment Issue Area
Map A4-4	Jesse Ewing Canyon Issue Area
Map A4-5	Goslin Mountain Issue Area
Map A4-6	Willow Creek Issue Area
Map A4-7A, 7B	Pronghorn Antelope and Whitetail Prairie Dog Habitat, Segments A and B
Map A4-8A, 8B	Elk Habitat, Segments A and B
Map A4-9A, 9B	Mule Deer and Sage Grouse Habitat, Segments A and B
Map A4-10A, 10B	Visual Resource Management Classifications, Segments A and B

Maps identified for this appendix are attached at the back of the EIS. These maps are printed on foldouts to be used in conjunction with the material contained in the EIS.

APPENDIX 5
ENDANGERED SPECIES ACT, SECTION 7 CONSULTATION

Page

Section 7 Consultation (will be available for final EIS)

Biological Assessment A5-1

Memorandum from U.S. Fish and Wildlife Service A5-4

BIOLOGICAL ASSESSMENT CHEVRON PHOSPHATE PROJECT

This biological assessment presents data on six federally listed species that could be affected by some of the Chevron project facilities or along the pipeline routes (see attached map). These species, which may be present in the concerned area, are included in the U.S. Fish and Wildlife Service (FWS) Section 7(c) list of species. This list was furnished to the Bureau of Land Management (BLM) in a memorandum dated August 6, 1982 (copy attached).

Based upon data in the assessment, BLM has determined that three species would not be affected by the Chevron project and four species have been determined to be in a *"may affect"* category. The four species of major concern are the black-footed ferret, Colorado squawfish, humpback chub, and whooping crane.

Each of the six species noted in the FWS memo are discussed below to indicate why a *may affect* or *no effect* determination was made.

Black-footed Ferret. The black-footed ferret (*Mustela nigripes*) may be the rarest animal on the North American continent (Gates 1973). The original range of the ferret and prairie dogs coincided with pre-settlement times. The black-footed ferret occupied almost all the mid- and short-grass prairie region from Saskatchewan and Alberta in the north, to areas of New Mexico and Texas in the south (Gates 1973). Recent studies of the ferret suggest that while still rare in South Dakota, it may be most abundant in that state (Linder and Hillman 1973; Henderson, et al. 1974). However, recently confirmed sightings in northern Wyoming may change some of these ideas. The ferret was listed as endangered when the endangered species list was first compiled in 1964 (Gates 1973).

Intensive studies of the ferret to obtain information on its life history were not started until 1964 when a family of ferrets was discovered in Mellette County, South Dakota. Up to that time, there was very little in the literature regarding this predatory animal. Studies now underway by the U.S. Fish and Wildlife Service near Meeteetse, Wyoming, should add much to the literature on this rare animal.

The prairie dog is the ferret's main source of food. The effect of ferrets on prairie dog populations depends on the size of the town or colony and the number of ferrets present. Parts of towns frequented by ferrets are thinly populated, while prairie dog densities are higher where ferrets are only occasionally found. When a ferret is active during the day, prairie dogs stay aboveground. In the vicinity of ferrets, they may appear very agitated. Prairie dogs frequently cover up burrows in which ferrets are found or where there is an odor of recent ferret presence. Ferrets seem to have no difficulty digging out of these situations (Snow 1972; Martin and Schroeder 1978).

Because very little population data is available, it is difficult to determine whether or not the total population is declining. The ferret apparently has never been common and has always been difficult to observe. Most ferrets have been observed in association with prairie dogs and the reduction in numbers of ferrets appears to follow declining prairie dog populations.

Potential Impacts

Colonies of prairie dogs are potential habitat for the ferret (Henderson, et al. 1969; Snow 1972; Clark 1977; Martin and Schroeder 1978). Whitetail prairie dog colonies could potentially occur on or along portions of the slurry pipeline or may be affected by construction of other facilities for the Chevron project in southwestern Wyoming and northeastern Utah which are in the historical range of the ferret. In recent years, ferrets have been reported from both states (Clark and Dorn 1979; Schroeder 1982).

While prairie dog colonies still exist in the two states, they have been much reduced and isolated as a result of efforts to control prairie dog populations. Any prairie dog colony could provide suitable habitat for the ferret, but several colonies, including some large ones, in relatively close proximity and with a stable prairie dog population appear to be necessary for the maintenance of a ferret population (Black-footed Ferret Recovery Team 1978; Colorado Division of Wildlife 1978; Queal, et al. 1977).

The disturbance associated with construction of this project could result, at least temporarily, in the loss of portions of some prairie dog colonies. The amount of habitat (or colonies) disturbed during pipeline construction is limited when viewed from an acreage standpoint (a 100-foot wide right-of-way converts to 12.12 acres per mile).

If any whitetail prairie dog colonies would be disturbed by construction activities associated with the Chevron Phosphate Project in southwestern Wyoming and northeastern Utah, a *may affect* determination from construction will exist until appropriate surveys have failed to locate ferrets in the affected colonies. It is anticipated that there will be a *no effect* determination as far as the project adversely affecting ferrets during the operation, maintenance, and abandonment. However, since BLM has determined that there is a *may affect* determination for the ferret during construction activities, an approved U.S. Fish and Wildlife survey is recommended for the staked construction sites prior to issuance of the Notice-to-Proceed.

Colorado Squawfish. The Colorado squawfish (***Ptychocheilus lucius***) is currently found in the Green River in limited numbers. However, early records indicate that the squawfish was once found throughout the Colorado River system from the Green River in Wyoming, to the Gulf of California, including the Gila River basin in Arizona. It was apparently abundant over all of its range prior to 1850 (Seethaler 1978).

Presently, the range of the squawfish is restricted to the Upper Colorado River Basin and numbers are declining (FWS 1982). Evidence at the present time (FWS 1982) indicates that reductions in peak flow levels, magnitude of the flows, and duration of the flow have changed habitat conditions in the Green River, thus contributing to reduced squawfish populations. For these reasons, any reduction in flow in the Green River could have an adverse impact on this fish species. The Chevron Phosphate Project proposes to purchase water from Fontenelle Reservoir, release this water into the Green River, and pick it up in the slack water area of Flaming Gorge Reservoir south of Green River, Wyoming. The water would then be pumped to the fertilizer plant *via* a diversion structure and pipeline.

There is also a proposed slurry water supply alternative that would require pumping water directly from the Green River near Jensen, Utah, and piping the water to the mine site north of Vernal, Utah. Therefore, since this project plans to utilize water directly from the Green River, adverse impacts to squawfish may be anticipated. Mortality of adults and juveniles in diversion structures is also a possibility.

Humpback Chub. The only populations of the humpback chub (***Gila cypha***) definitely known to exist in the upper Colorado River basin are found in Black Rocks and Westwater Canyons on the main Colorado River.

However, since there is a possibility that this particular species could occur in the Green River, adverse impacts from reduced flows and accidental mortality in diversion structures are distinct possibilities.

Whooping Crane (*Grus americana*). Populations of wild and captive whooping cranes have slowly increased from the low levels of the early 1940's. The Gray's Lake foster parent experiment in Idaho has produced a small, but slowly increasing, flock of whooping cranes that migrate from Idaho to New Mexico. These rare birds migrate in the company of sandhill cranes and could overfly some of the Chevron project components. Sandhill cranes have been observed to frequent the Green River area near Jensen, Utah, and whooping cranes could accompany these flocks. There could be a slight possibility that the whooping crane could be adversely affected by construction and operation of the Jensen alternative pipeline.

Bald Eagle. The bald eagle (***Haliaeetus leucocephalus***) occurs in the project area mainly as a winter resident and a spring and fall migrant. These birds congregate at specific wintering sites in Utah and Wyoming from early November through March of each year. Open water in the Green River below Flaming Gorge Reservoir during the winter attracts eagles because of fish and waterfowl availability. Additional food is provided by winter-killed deer and upland populations of rabbits. Trees along the river are also utilized as roost sites.

It is not likely that the project will adversely affect wintering bald eagles as the Green River will be crossed only once by the slurry pipeline and the in-stream diversion structures will only take up about 1 acre of riparian habitat. Because of the total amount of riparian winter habitat available in the vicinity of the river crossing and the diversion structures, no adverse impacts are anticipated to the bald eagle.

Peregrine Falcon. Populations of peregrine falcons (***Falco peregrinus***) declined sharply in the 1940's, and this species has practically disappeared as a wild breeding bird east of the Mississippi River. These birds are known to nest in Dinosaur National Monument and could overfly some project facilities. Habitat in the vicinity of the Green River crossing appears to be suitable for nesting falcons, and the Utah Division of Wildlife Resources also considers habitat along the Green River to be suitable for falcons. However, since no falcon aeries are known to occur near the Green River crossing, the proposed Chevron Phosphate Project is not likely to adversely affect the peregine falcon.

United States Department of the Interior
FISH AND WILDLIFE SERVICE
AREA OFFICE COLORADO—UTAH
1311 FEDERAL BUILDING
125 SOUTH STATE STREET
SALT LAKE CITY, UTAH 84138-1197

IN REPLY REFER TO:

6 August 1982

MEMORANDUM

TO: Chief, Environmental Impact Statement Services
U. S. Bureau of Land Management, Denver, Colorado

FROM: Project Leader, Endangered Species Office,
U. S. Fish and Wildlife Service, Salt Lake City, Utah

SUBJECT: Chevron Phosphate Fertilizer Complex EIS

We have reviewed your memorandum of 9 July 1982 concerning the Cheveron Phosphate Fertilize EIS. It appears that listed endangered and threatened species, or species proposed for listing, may occur in the area of influence of this action.

To comply with Section 7(c) of the Endangered Species Act of 1973, as amended, Federal agencies or their designees are required to obtain from the Fish and Wildlife Service (FWS) information concerning any species, listed or proposed to be listed, which may be present in the area of a proposed construction project. Therefore, we are furnishing you the following list of species which may be present in the concerned area:

black-footed ferret	Mustela nigripes
bald eagle	Haliaeetus leucocephalus
peregrine falcon	Falco peregrines
whooping crane	Grus americana
Colorado squawfish	Ptychocheilus lucius
humpback chub	Gila cypha

In addition to the above mentioned endangered species we would like to bring to your attention the following plant species which are currently under review by the FWS (Federal Register Vol. 45, No. 242, December 15, 1980.)

Penstemon yampaensis
Lesquerella macrocarpa

Section 7(c) also requires the Federal agency proposing a moajor Federal action significantly affecting the quality of the human environment to conduct and submit to the FWS a biological assessment to determine the effects of the proposal on listed and proposed species. The biological assessment shall be completed within 180 days after the date on which initiated or a time mutually agreed upon between the agency and the FWS. Before physical modification/alternation of a major Federal action is begun the assessment must be completed. If the biological assessment is not begun within 90 days, you should verify this list with us prior to initiation of your assessment. We do not feel that we can adequately assess the effects of the proposed action on listed and proposed species or critical habitat and proposed critical habitat without a complete assessment. When conducting a biological assessment, you shall, at a minimum:

1. conduct a scientifically sound on-site inspection of the area affected by the action, which must, unless otherwise directed by the FWS, include a detailed survey of the area to determine if listed or proposed species are present or occur seasonally and whether suitable habitat exists within the area for either expanding the existing population or potential reintroduction or populations;

2. interview recognized experts on the species at issue, including those within the Fish and Wildlife Service, state conservation agencies, universities, and others who may have data not yet found in scientific literature;

3. review literature and other scientific data to determine the species' distribution, habitat needs, and other biological requirements;

4. review and analyze the effects of the action on the species, in terms of individuals and populations, including consideration of the cumulative effects of the action on the species and habitat;

5. analyze alternative actions that may provide conservation measures;

6. conduct any studies necessary to fulfill the requirements of (1) through (5) above;

7. review any other relevant information.

The FWS can enter into formal Section 7 consultation only with another Federal agency or its designee. State, county, or any other governmental or private organizations can participate in the consultation process, help prepare information such as the biological assessment, participate in meetings, etc.

After your agency has completed and reviewed the assessment, it is your responsibility to determine if the proposed action "may affect" any of the listed species or critical habitats. You should also determine if the action is likely to jeopardize the continued existence of proposed species or result in the destruction or an adverse modification of any critical habitat proposed for such species. If the determination is "may affect" for listed species you must request in writing formal consultation from the Project Leader, Endangered Species Office, U.S. Fish and Wildlife Service at the address given above. In addition, if you determine that the proposed action is likely to jeopardize the continued existence of proposed species or result in the destruction or adverse modification of proposed critical habitat, you must confer with the FWS. At this time you should provide this office a copy of the biological assessment and any other relevant information that assisted you in reaching your conclusion.

Your attention is also directed to Section 7(d) of the Endangered Species Act, as amended, which underscores the requirement that the Federal agency or the applicant shall not make any irreversible or irretrievable commitment of resources during the consultation period which, in effect, would deny the formulation or implementation of reasonable and prudent alternatives regarding their actions on any endangered or threatened species.

We are prepared to assist you whenever you have questions which we may be able to answer. If we can be of further assistance, please advise us.

The names and addresses of recovery team leaders for the species of concern you requested are as follows:

Species	Recovery Team Leader
1. black-footed ferret	Dr. Raymond L. Linder South Dakota Cooperative Wildlife Research Unit Department of Wildlife and Fisheries Sciences South Dakota State University Brookings, South Dakota 57006 (605) 688-6121 (201) 237-8444
3. American peregrine falcon	Mr. Gerald Craig Colorado Division of Wildlife P. O. Box 2287 Fort Collins, Colorado 80522 (303) 482-6575
4. whooping crane	David L. Olsen Cheif, Branch of Operations U. S. Fish and Wildlife Service Room 2344, Main Interior Building Washington, D.C. 20240
5. Colorado Squawfish 6. humpback chub	James A. St. Amant California Department of Fish and Game 350 Golden Shore Long Beach, California 90802 (213) 590-5151

The FWS representative who will provide you with technical assistance is J.Larry England of this office (FTS) 588-4430.

W. Robert Benton

W. Robert Benton

Acting Project Leader, SE

APPENDIX 6
VISUAL RESOURCE MANAGEMENT METHODOLOGIES

In order to analyze the landscape that would be affected by the proposed action or alternatives, the Bureau of Land Management (BLM) Visual Resource Management (VRM) system and the Forest Service Visual Management System (VMS) were used.

To compare the visual impacts of the proposed action with the alternatives and the existing environment, and the VRM system was applied to lands managed by the BLM, as well as other federal lands (for national forest lands, the VMS procedure was applied), and state, local, and private lands.

The following three sections describe the VRM system, the VMS, and the BLM contrast rating procedure.

THE BLM VISUAL RESOURCE MANAGEMENT SYSTEM

The VRM system is an analytical process that identifies, sets, and meets objectives for maintaining scenic values and visual quality (BLM 1978, 1980).

The system is based on research that has produced ways of assessing aesthetic qualities of the landscape in objective terms. Aesthetic judgments considered extremely subjective were found to have identifiable, consistent qualities that can be described and measured. Whatever the terrain and whoever the observer, perception of visual quality in a landscape seems to be based on three common principles:

- Landscape character
- Influence of form, line, color, and texture
- Visual variety

Landscape character is primarily determined by the four basic visual elements of form, line, color, and texture. Although all four elements are present in every landscape, they exert varying degrees of influence. The stronger the influence exerted by these elements, the more interesting the landscape. The more visual variety in a landscape, the more aesthetically pleasing the landscape. However, variety without harmony is unattractive, particularly if alterations (cultural modifications) are made carelessly.

The VRM system (Figure A6-1) involves a four-step process: (1) determining the scenic quality of a landscape, (2) measuring the visual sensitivity of an area, (3) determining distance zones, and (4) compiling all the information into management classes for guidance in assessing environmental impacts.

THE FOREST SERVICE VISUAL MANAGEMENT SYSTEM

The VMS establishes criteria for identifying and classifying scenic qualities as well as aesthetic concern for those qualities on national forest lands (FS 1974). The process establishes quality objectives for altering the visual resource by recognizing the great variation in visual strength of the various types of natural landscapes and their inherent capabilities to accept change.

In this process, a particular landscape is placed within a framework for analysis (Figure A6-2). The framework is the character type or common distinguishing visual characteristic of landforms, water forms, and vegetative patterns based upon physiographic regions as defined by Fenneman (1931). The characteristic landscape is the naturally established landscape being viewed; it serves as the final basis for analyzing and comparing the appropriateness of a management activity against the prescribed quality objective.

The Visual Quality Objective (VQO) incorporates the extreme variability of the land's scenic quality, the visual sensitivity of the land, and the ability of various forest landscapes to undergo alteration.

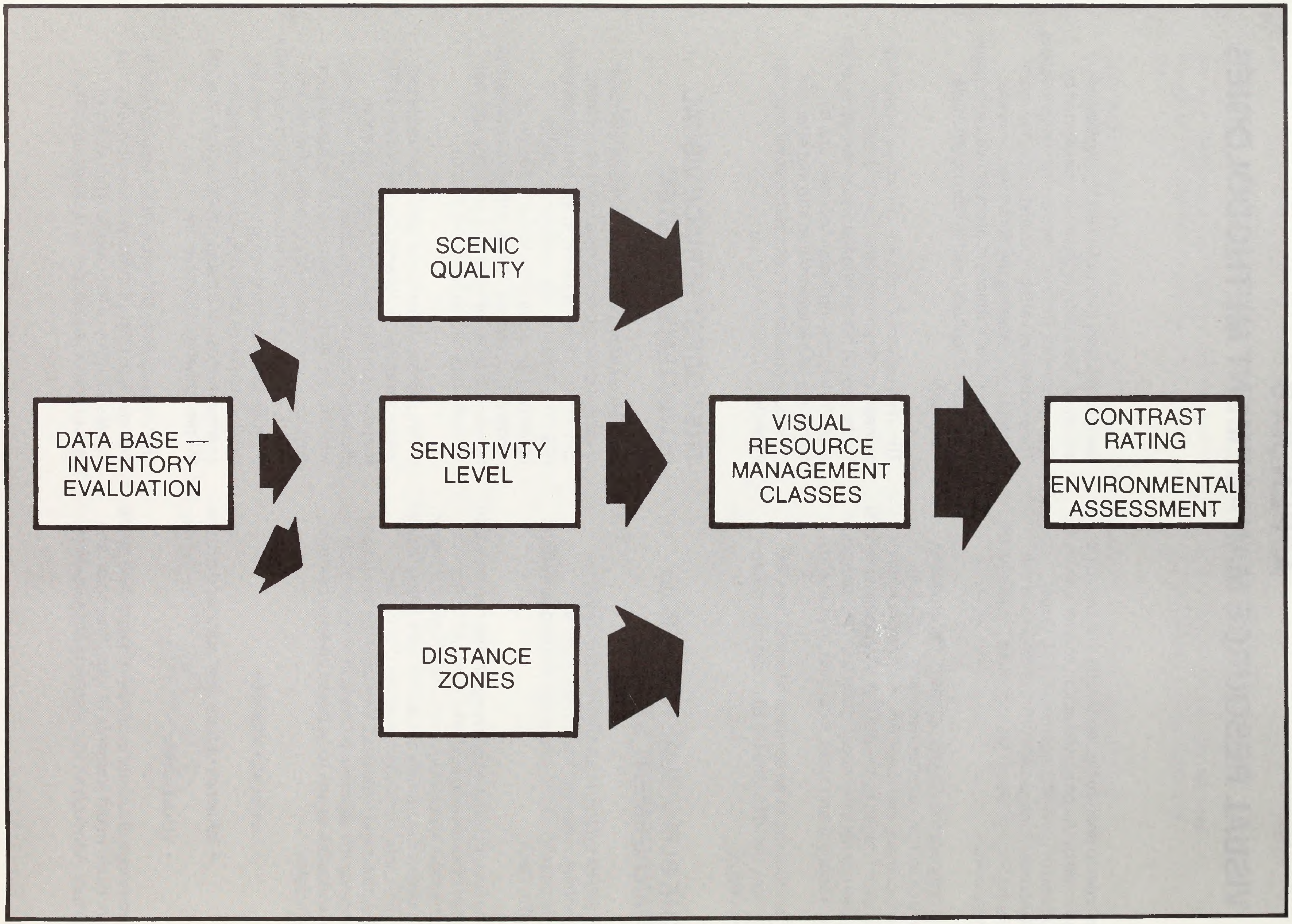


FIGURE A6-1 THE VISUAL RESOURCE MANAGEMENT SYSTEM PROCESS

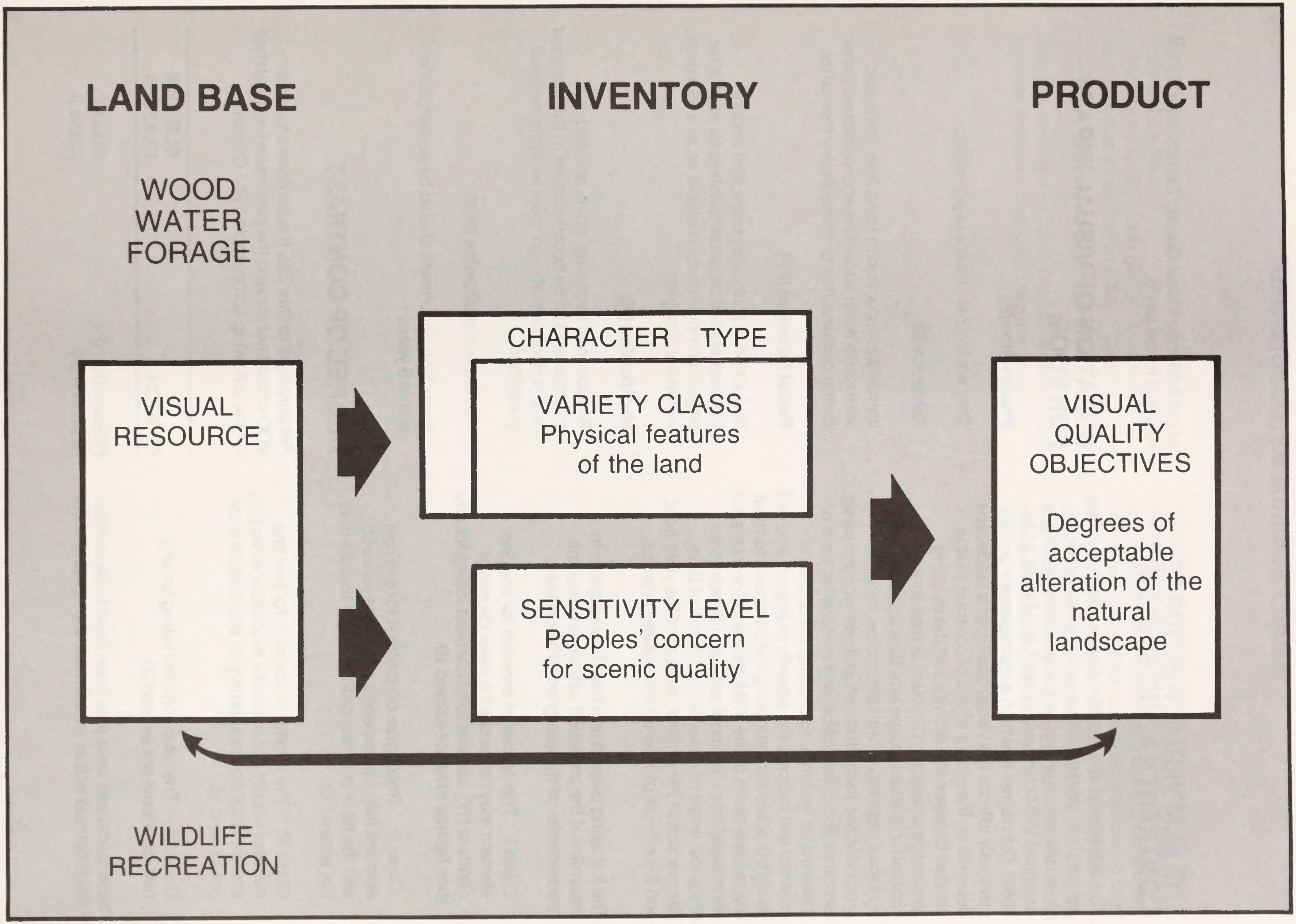


FIGURE A6-2 THE VISUAL MANAGEMENT SYSTEM PROCESS

THE BLM VISUAL RESOURCE CONTRAST RATING SYSTEM

The objective of the visual resource contrast rating system is to provide a measure of whether the proposed action will meet the requirements of the assigned VRM classes (FS 1974, BLM 1978, BLM 1980). The degree to which a management activity adversely affects the visual quality of a landscape depends on the extent of visual contrast that is created between the activity and the existing landscape character. Contrast is measured by separating the landscape into land and water surfaces, vegetation, and structures, then predicting the magnitude of contrast with the basic elements (form, line, color, and texture) for each of these major features. Assessing the degree of contrast will indicate the severity of impact and will guide the plans for mitigating the contrasts to meet the requirements of the VRM classes. Contrasts are considered from the most critical viewpoints for distance, angle of observation, length of time, relative size of the project, season of the year, light, and the effects of time on the healing process.

The following parameters have been applied to determine if the proposed action will meet the requirements of the assigned VRM classes.

Class I: The degree of contrast for any one element may not exceed a weak degree of contrast (1x), and the total contrast rating for any one feature may not exceed 10.

Class II: The degree of contrast for any one element may not exceed a moderate value (2x), and the total contrast rating for any feature may not exceed 12.

Class III: The degree of contrast for any one element should not exceed a moderate value (2x), and the total contrast rating for any feature may not exceed 16.

Class IV: The total contrast rating for any feature should not exceed 20.

These guidelines have also been used to determine if the proposed action would meet the requirements of the assigned Visual Quality Objective (VQO) on national forest lands.

DURATION OF VISUAL IMPACT FOR VQO's

Preservation (P)

Only ecological change is permitted.

Retention (R)

Immediate reduction in form, line, color, and texture contrast should be accomplished either during construction or immediately thereafter.

Partial Retention (PR)

Reduction in form, line, color, and texture contrast should be accomplished as soon after project completion as possible or, at a minimum, within the first year.

Modification (M)

Reduction in form, line, color, and texture contrast should be accomplished in the first year or at a minimum should meet existing regional guidelines.

Maximum Modification (MM)

Reduction of contrast should be accomplished within 5 years.

DEGREE OF CONTRAST

For purposes of this EIS, the contrasts for each VQO should not exceed the parameters established for the following comparable VRM Classes:

FS VQO's	BLM VRM CLASSES
Preservation (P)	Class I
Retention (R)	Class II

Partial Retention (PR)	Class III
Modification (M) and Maximum Modification (MM)	Class IV
Unacceptable Modification (UM)	Class V

Specific contrasts in form, line, color, and texture indicate problems that could require design mitigation. Applying design procedures to the proposed action could eliminate or reduce visual contrasts to meet the visual planning objectives stipulated in the VRM class designations. If this were done, the project would be reassessed to determine if it could meet the area's visual goals and, if not, to what degree the landscape's visual resource would be affected.

APPENDIX 7
RECLAMATION AND EROSION CONTROL PLAN ANALYSIS

In order to achieve successful reclamation and erosion control on lands disturbed by project development and operation, an intensive reclamation program would be required. Important variables within the project area that would strongly affect reclamation success include: (1) climatic conditions (low, erratic precipitation and high winds); (2) soil properties, such as shallow depths, thin surface layers, low inherent fertility, moderate to strong salinity and alkalinity, hard bedrock, and the volumes of rock fragments; (3) strongly sloping to very steep sloping terrain; (4) preconstruction variations in vegetation types and their low densities; (5) livestock grazing control on newly seeded areas; and (6) off-road vehicle traffic control on access roads to minimize off-road land surface disturbance. The reclamation procedures that would be incorporated into the Chevron Construction and Operation Plan are described in Appendix 2, Section A.2.2.

Soil Groups

Following is a brief description of the soil groups that can be found within the project area.

Soils of the terraces and floodplains. This group consists of deep, well- drained to somewhat poorly drained, loamy and sandy loam soils that are located on the nearly level to gently sloping floodplains of the narrow, elongated, intermittent drainageways. These soils are formed in mixed alluvium derived from sedimentary rock. They are subject to a slight to moderate erosion hazard, and in some areas, a moderate to strong saline and alkaline condition. They are the most productive soils of the area and are used for grazing. These soils occur in areas with an average annual precipitation of less than 9 inches and in areas with 10 to 16 inches average annual precipitation.

Soils of the rolling uplands, high terrances, alluvial fans and plateaus. This group consists of shallow to deep, well-drained, loamy and sandy loam soils that are located on sloping to rolling hills, convex ridges, and plateaus. These soils were formed in mixed materials, weathered from sedimentary and metamorphic rocks, with varying amounts of rock fragments on the surface and varying depth. The shallow and moderately deep soils are located on steeper sloping areas, have low productivity, are sparsely vegetated, and are subject to a moderate to high erosion hazard. These soils are used for limited livestock grazing and wildlife habitat, and occur in areas with an average annual precipitation of less than 9 inches and in areas with 10 to 16 inches average annual precipitation.

Shallow, steep sloping soils and rock outcrops. This group contains predominantly shallow to medium deep, well-drained, moderately alkaline, loamy and sandy loam soils that are located on moderately steep to very steep sideslopes and escarpments bordering intermittent drainageways and stream courses. They are very sparsely vegetated and subject to high runoff and high erosion hazard (geologic erosion). These soils are used mainly for watershed, wildlife habitat, and very limited livestock grazing, and occur in areas with an average annual precipitation of less than 9 inches and in areas with 10 to 16 inches average annual precipitation.

Moderately dark colored soils of the plateaus and sideslopes. This group contains soils that are moderately deep and deep, well-drained, neutral to moderately alkaline, loamy, and clay loam soils that are located on gently sloping to sloping plateaus. These soils are subject to a slight to moderate erosion hazard. Shallow to moderately deep, loamy soils on strongly sloping to moderately steep side slopes bordering the intermittent drainageways associated with a dendritic drainage pattern are also included in this group. These soils are used for livestock grazing and wildlife habitat, and occur in areas with a higher than average annual precipitation of 14 to 20 inches.

Soils of the mountains and high plateaus. This group consists of soils that are mainly shallow and moderately deep, well-drained, slightly acid to mildly alkaline, sandy-loam and loamy soils, and are most commonly located with rocky surface layers and coarse fragments ranging from 15 to 60 percent. These soils are forming in place from metamorphic and sedimentary rock. They are on steep and very steep mountain side slopes and canyon rims. Deep loamy, skeletal soils located on top slopes and on narrow elongated floodplains are common inclusions. These soils are subject to landslides and moderate to high erosion hazards. They are used mainly for wildlife habitat, limited livestock grazing and watershed, and occur in area with an annual precipitation range of 12 to 20 inches.

Soils of the mountain valleys and drainage ways with 10 to 16 inches annual precipitation. This group contains soils that are deep, well drained, neutral to moderately alkaline, loamy soils located on gently sloping to moderately sloping narrow concave valleys and draws bordered by steep mountain sideslopes. They formed in mixed loamy alluvial materials and are productive soils. They are used mainly for grazing and production of native hay. While they are subject to a slight erosion hazard, these soils have a high potential for reclamation and revegetation.

Soils of the mountain floodplains. This groups consists of soils that are mainly deep, well-drained, neutral to mildly alkaline, loamy-skeletal soils containing 15 to 60 percent coarse fragments and rock that are located on narrow floodplains with intermittent stream coarses bordered by steep and very steep mountain sideslopes. These soils are used mainly for wildlife habitat and limited grazing. These soils are subject to flooding and stream cutting. An example of a larger area where these soils occur are the Red Creek floodplains.

ASSUMPTIONS

The analysis of the reclamation and erosion control plan was based on the following assumptions:

1. The requirements identified in Appendix 2, Section A.2.2, will be stipulated for use on all federal lands involved with this project, and that appropriate compliance procedures will be carried out by the appropriate federal authorized officer.
2. Chevron will further apply the reclamation procedures described in Appendix 2, Section A.2.2, to private and state land that would be crossed or otherwise affected by any project component.

RECLAMATION AND EROSION CONTROL ANALYSIS

The reclamation and erosion control procedures (Appendix 2, Section A.2.2) were developed and evaluated using information collected in the soils and vegetation review of the project. The result of the evaluation was the determination that if the procedures were followed and the appropriate monitoring occurred, then the disturbed areas would be successfully revegetated upon completion of the construction phase of the project. The methodology used to complete the evaluation is discussed below.

Soils, vegetation, and climatic information was collected for the surface areas which could be disturbed by the proposed action or alternatives. Soil surveys were reviewed to identify soil types and terrain strongly affecting construction procedures and revegetation and restoration potential.

The soils data was analyzed and evaluated to identify:

- areas with soil properties that strongly affect restoration of cropland and revegetation of native rangeland;
- areas subject to slides, rockfall, and mass movement;
- areas that are susceptible to high wind and water erosion hazards;
- effective measures to minimize the effect of soil disturbances caused by construction activities and to control accelerated erosion;
- areas where erosion and resultant sediment yield would affect water quality.

Soil erosion losses were estimated using the universal soil loss equation (USLE) and the wind erosion equation as applied to construction sites for selected soil areas representing various conditions occurring throughout the proposed project area. Recent developments in the USLE make it a potentially valuable tool for selecting and evaluating conservation practices on areas disturbed by construction activities. The information gained by application of the USLE to selected soil sites was used as a basis for determining appropriate erosion control and revegetation measures and to evaluate the effectiveness of those measures to ensure successful erosion control, revegetation, and restoration.

Selected soils representing significant conditions in the project areas were analyzed. Additional information, consisting of major rangeland management concerns and recommended conservation practices, was obtained from published detailed soil survey reports and the unpublished Uintah County Soil Survey.

The reclamation and erosion control procedures were developed from the procedures outlined above to cover the range of soil and vegetation types, terrain, land uses, and climatic conditions. A detailed construction and erosion control plan will be developed prior to construction including locally recommended techniques and measures tailored to the conditions encountered. Proper implementation of the outlined erosion control and revegetation measures would assure successful restoration of land disturbed by project construction activities.

The outlined maintenance and monitoring program would also identify problem areas caused by adverse weather conditions during restoration periods or in small localized areas with adverse soil properties, and would provide corrective measures to ensure erosion control.

REVEGETATION

The six broad vegetation types are a composite of several plant communities that occur within a particular climatic or physiographic setting. The saltbush and greasewood, located at lower elevations near the Green River and Little Bitter Creek, are composed of salt-tolerant, drought-resistant plants. The plant densities are low, and are located in various areas ranging from barren to 20 percent ground cover in a 7- to 9-inch annual precipitation zone.

Revegetation is difficult in this low precipitation range; however, with timing of seeding and the addition of a mulch, a grass and forb cover can be successfully established within 2 to 10 years. Without a mulch, direct seeding is not recommended. The area disturbed would be shaped, surface rock or debris replaced, and the area allowed to revegetate naturally. This process could require up to 10 years for establishment of understory growth and from 20 to 40 years for shrubs and woody species to achieve preconstruction size and dimensions.

The pinyon-juniper type, sagebrush-grass, mountain shrub-aspen, and riparian vegetation types occupy different climatic zones but are basically composed of three classes of vegetation—tree species, brush and shrub species, and grass and forb species. Tree species would reseed naturally, but the planting of seedlings would ensure a greater degree of success. It would take 20 years for willows and up to 100 years for conifer aspen trees to reach full dimensions. Brush and shrub species would reseed naturally sprouting from roots, or could be planted in containers. Approximately 10 to 40 years would be required for full regrowth. Grass and forb species could be reseeded with successful establishment anticipated within 2 to 5 years following reseeding.

Revegetation can be achieved utilizing various techniques; however, from 2 to 10 years would be required to establish seedlings. The degree of success would be determined by the application of techniques and the degree of compliance exercised by the authorizing agency or landowner.

SUMMARY

It is predicted that successful erosion control, reclamation, and revegetation generally would be achieved throughout the project area provided that Chevron implements effective measures and procedures tailored to the kind of land disturbance and to the conditions encountered. It is emphasized however, that in order to ensure reclamation success, a strong compliance program accompanied by an effective monitoring and maintenance program is necessary to ensure that applicable measures are effectively applied and that follow-up measures are carried out. The compliance program would be conducted by the appropriate authorizing agencies and landowners. However, impacts to soils and the potential to produce preconstruction vegetation would be significant if applicable erosion control measures were not implemented due to lack of compliance with approved plans or if adverse weather conditions, mainly heavy rainstorms, occurred during construction before any erosion control measures could be installed.

APPENDIX 8
RUPTURES AND SPILLS

Slurry composition: 62 percent phosphate, 38 percent water, by weight.
Specific gravity: Water = 1, phosphate = 3.1
Density: Water = 62.4 lb/ft^3, phosphate = 193.4 lb/ft^3

Slurry composition, by volume:

$$\frac{62 \text{ lb. phosphate}}{193.4 \text{ lb/ft}^3} = 32 \text{ ft}^3$$

$$\frac{38 \text{ lb. water}}{62.4 \text{ lb/ft}^3} = 61 \text{ ft}^3$$

$$\text{Percent phosphate} = \frac{32 \text{ ft}^3 \text{ phosphate}}{93 \text{ ft}^3 \text{ slurry}} = 34\% \text{ phosphate}$$

$$\text{Percent water} = \frac{61 \text{ ft}^3 \text{ water}}{93 \text{ ft}^3 \text{ slurry}} = 66\% \text{ water}$$

Spill in the Green River

Assume:

22 miles of 11.25 inch (0.9375 foot) diameter pipe will drain.

Volume of spill = volume of pipe:

22 mi × 5,280 ft/mi = 116,160 ft.

$$116{,}160 \text{ ft.} \times \left(\frac{0.9375 \text{ ft}^3}{2}\right) \times 3{,}1416 = 80{,}184 \text{ ft}^3$$

Volume of phosphate:

0.34% × 80,184 ft^3 = 27,263 ft^3 27 ft^3/yd = <u>1,010 yd^3</u>

Volume of water:

0.66% × 80,184 ft^3 = 5,292 ft^3 7.4805 gal/ft^3 = 395,879 gal
= 1.21 acre-feet

Based upon the above amount of phosphate; the following physical characteristics and the river flow parameters, some conclusions can be made about sediment transport:

River velocity 2 feet per second
River depth 2 feet
River width 200 feet
Phosphate fall veolocity (48 × 65 mesh) 3.7 cm per second or 1.46 inches per second

RUPTURE AND SPILLS DATA

The sieve analysis provided in Chevron's technical report (1982) gives a fall velocity of 1.46 inches per second for the 48 $\times$ 65 mesh; this represents the largest grain sizes in the slurry and is about 2 percent of the total. These particles would take 16.44 seconds to fall 2 feet and in that time, move 33 feet downstream from the spill site.

Flat Land Spill

Assumptions:

5 miles of pipe could drain; however, the pipeline would plug when 50 percent of the contents had drained = 26,400 ft.

11.25 inch pipe (inside diameter) $(11.25/2)^2 \times 3.14 = 99.35/144 = 0.69\ ft^2$

$26{,}400\ ft \times 0.69\ ft^2 = 18{,}216\ ft^3$ pipe volume.

Volume of phosphate:

$0.34\% \times 18{,}216\ ft^3 = 6{,}193\ ft^3/27 = 229\ yd^3 \times 50\% = 115\ yd^3$

or

$6{,}193\ ft^3 \times 187$ lbs per ft^3 = 1,158,091 lbs/2,000 lb/ton = 579 $\times$ 50 percent = 290 tons

Volume of water:

$0.66\% \times 18{,}216\ ft^3 = 12{,}023\ ft^3 \times 7.5$ gal per ft^3 = 90,173 gal/325,851 gal/ac-ft - 0.27 ac-ft

Side Hill Spill

Assumptions:

18 miles of pipeline will completely drain 95,050 ft of pipe 11.25 inch pipe (inside diameter): $(11.25\ in/2)^2 \times 3.14 = 99.35\ in^2/144\ in^2/ft^2$

$99.35\ in^2/144\ in^2/ft^2 = 0.69\ ft^2$
$95{,}050\ ft \times 0.69\ ft^2 = 65{,}578\ ft^2$ = pipe volume

Volume of phosphate:

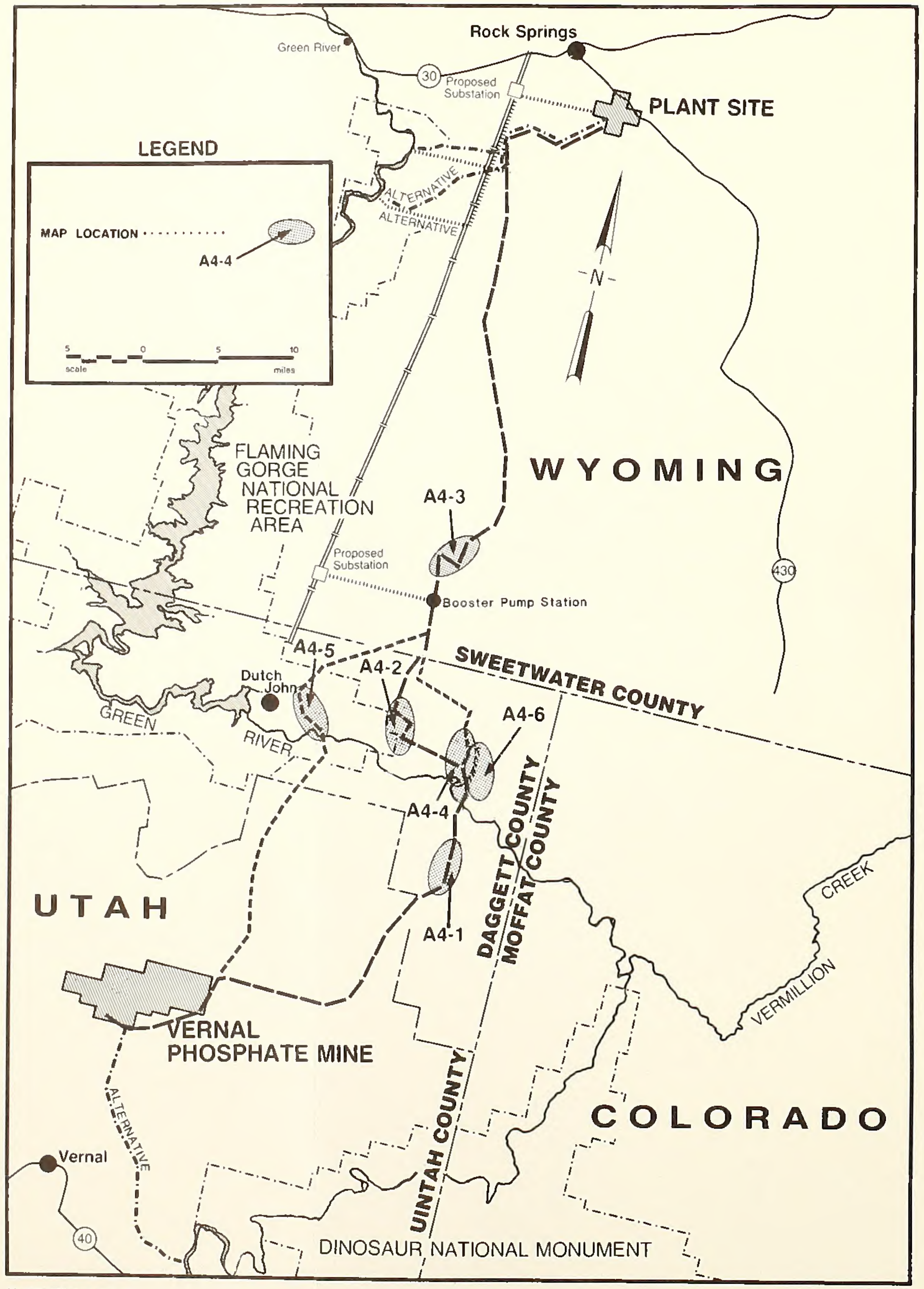
$0.34\% \times 65{,}578\ ft^3 = 22{,}295\ ft^3/27\ ft^3/yd^3 = 826\ yd^3$

or

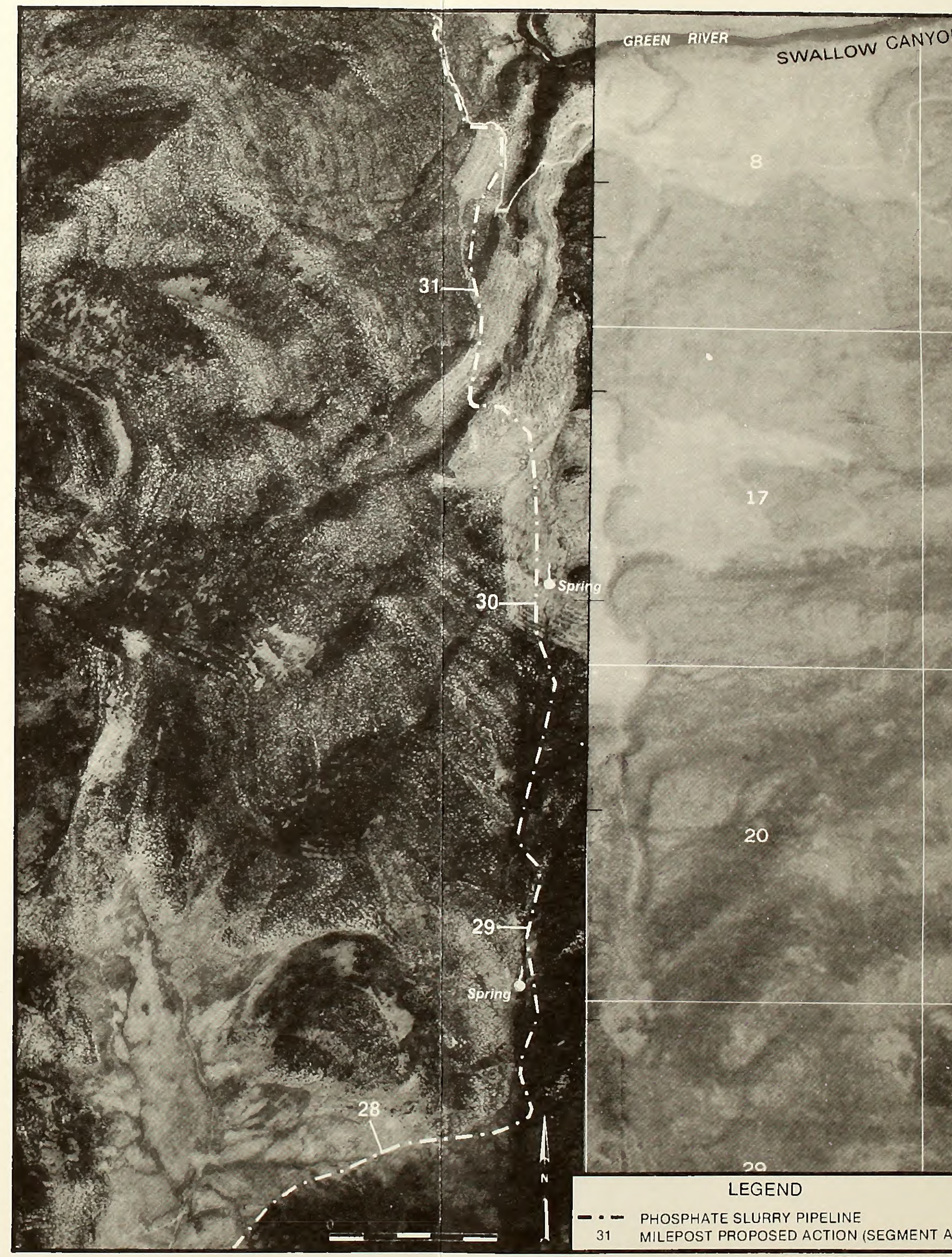
$22{,}297\ ft^3. \times 187\ lbs/ft^3 = 4{,}169{,}539$ lbs/2,000 lbs/ton = 2,085 tons

Volume of water:

$0.66\% \times 65{,}578\ ft^3 = 43{,}281\ ft^3 \times 7.5\ gal/ft^3 = 324{,}608$ gal/325,851 gal/ac-ft = 0.99 ac-ft

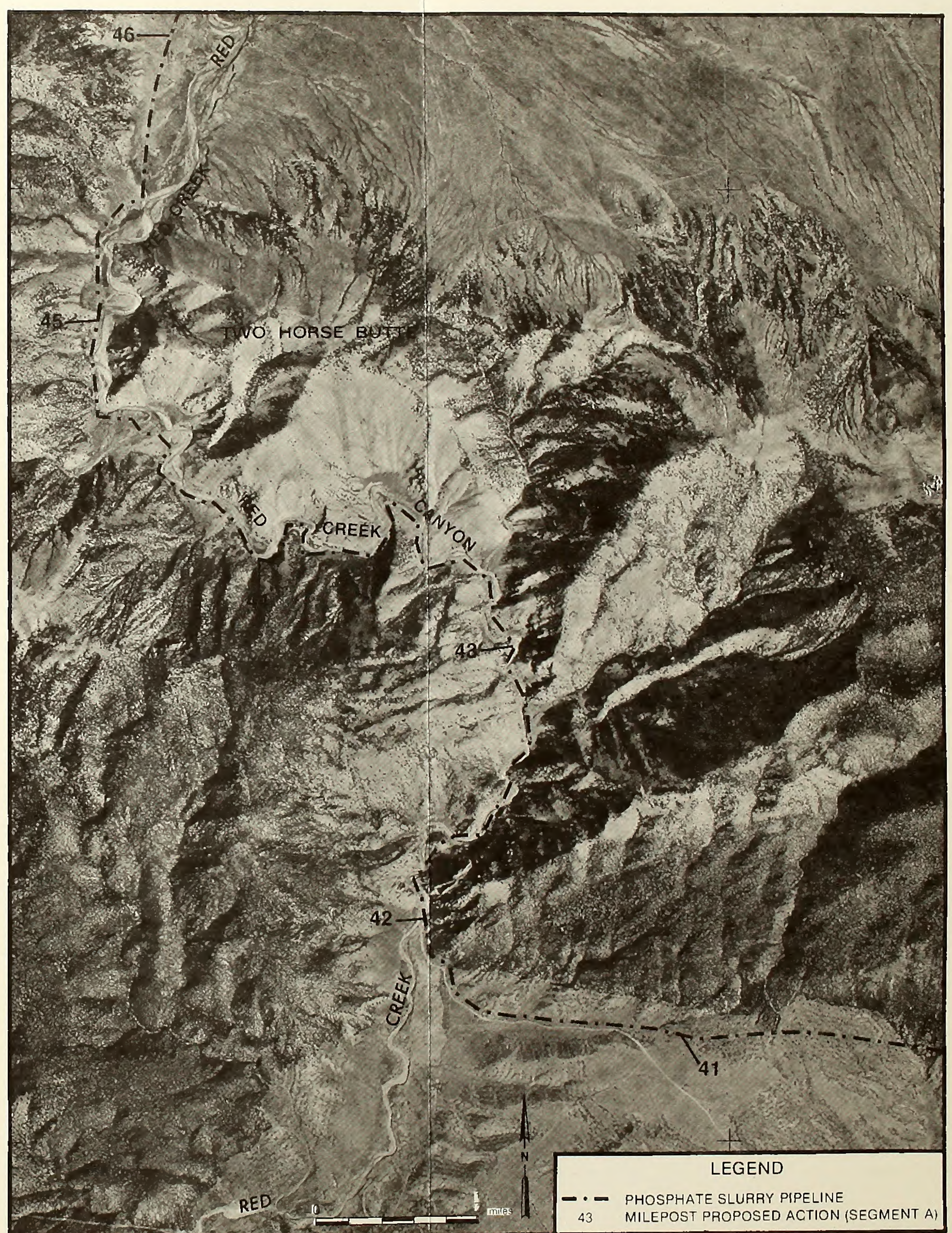


INDEX MAP



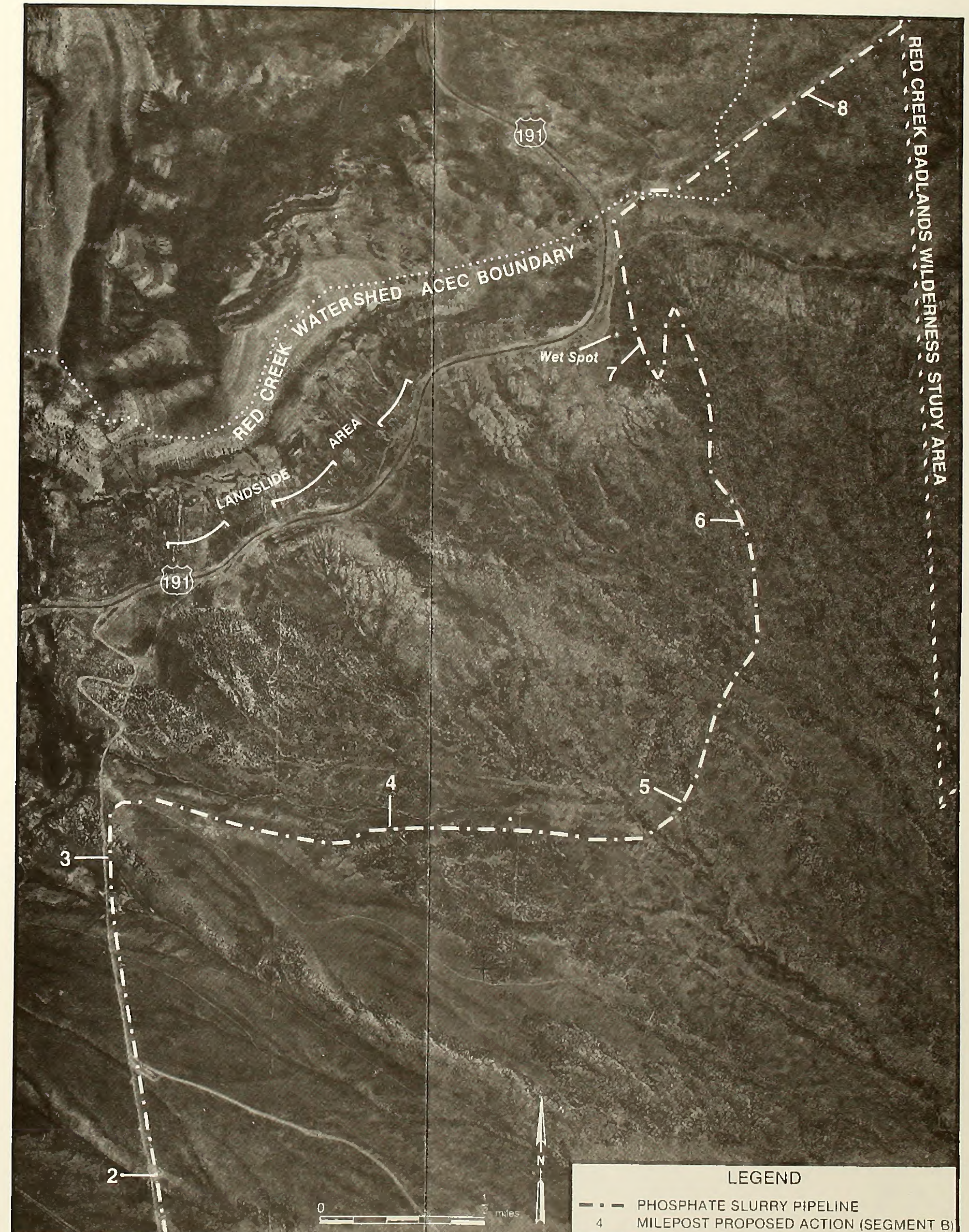
MAP A4-1 RYE GRASS DRAW ISSUE AREA

PROJECT DETAILS AND SECTION LINES ARE APPROXIMATE



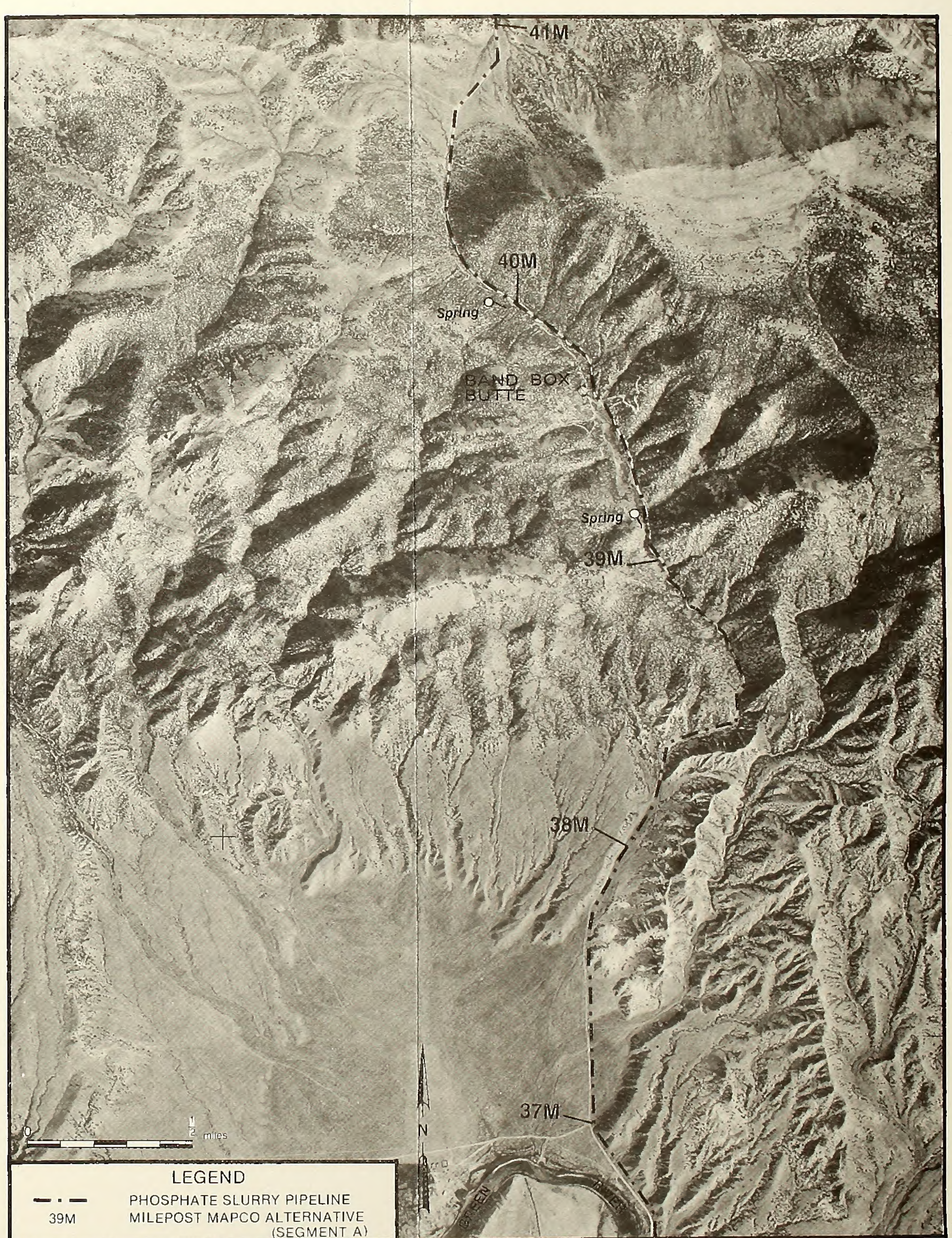
PROJECT DETAILS AND SECTION LINES ARE APPROXIMATE

MAP A4-2 RED CREEK CANYON ISSUE AREA



MAP A4-3 RED CREEK BASIN ESCARPMENT ISSUE AREA

PROJECT DETAILS AND SECTION LINES ARE APPROXIMATE

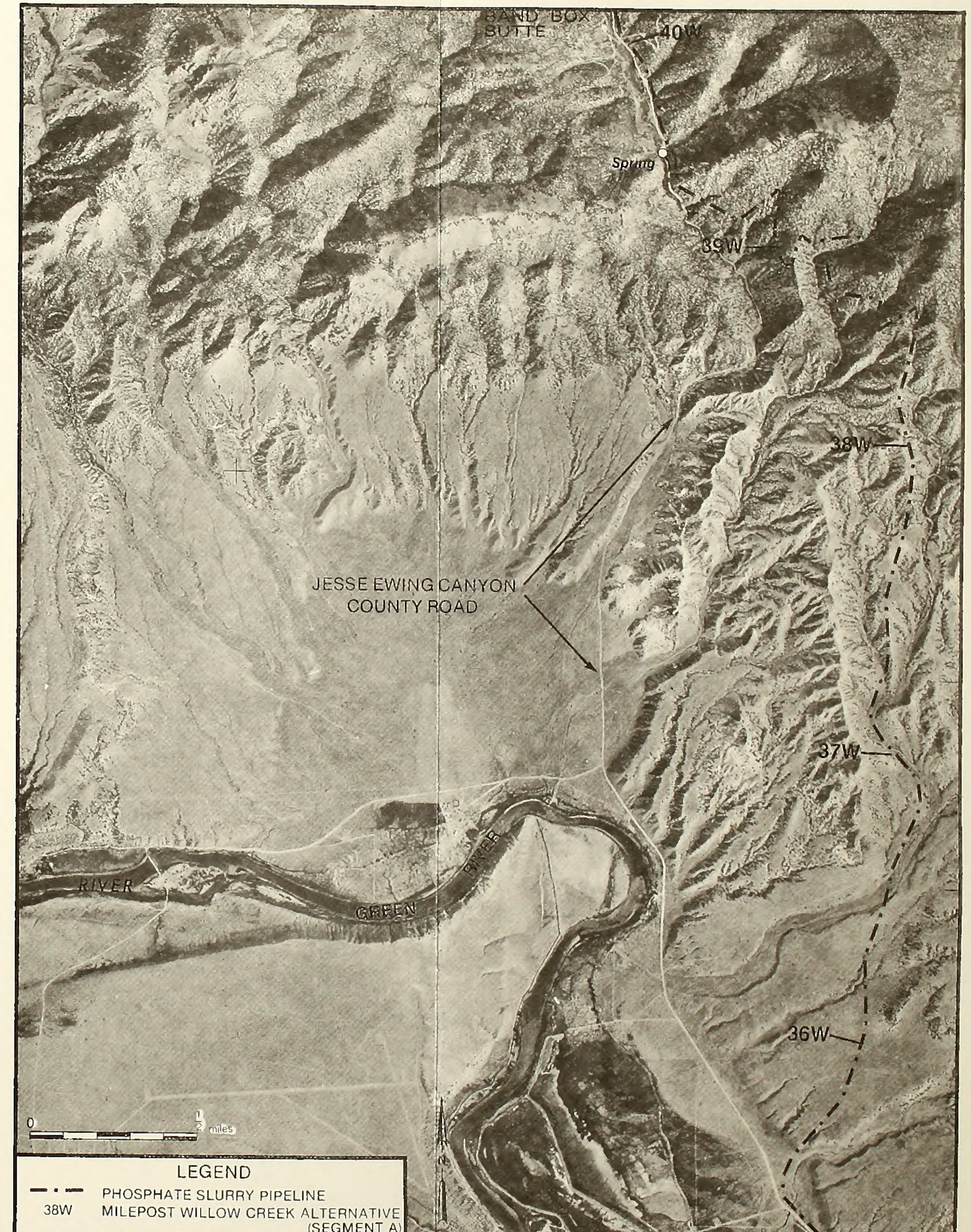


PROJECT DETAILS AND SECTION LINES ARE APPROXIMATE

MAP A4-4 JESSE EWING CANYON ISSUE AREA

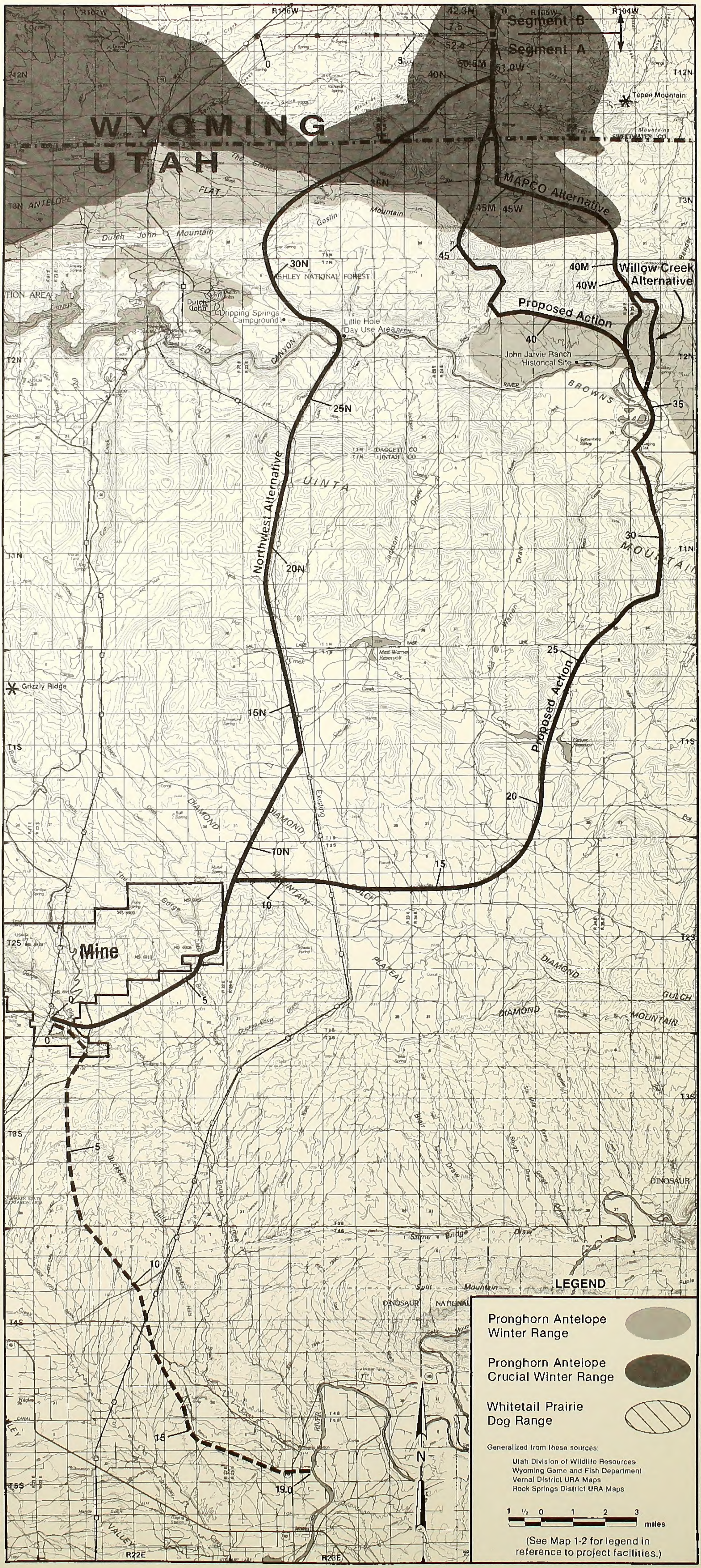
PROJECT DETAILS AND SECTION LINES ARE APPROXIMATE

MAP A4-5 GOSLIN MOUNTAIN ISSUE AREA

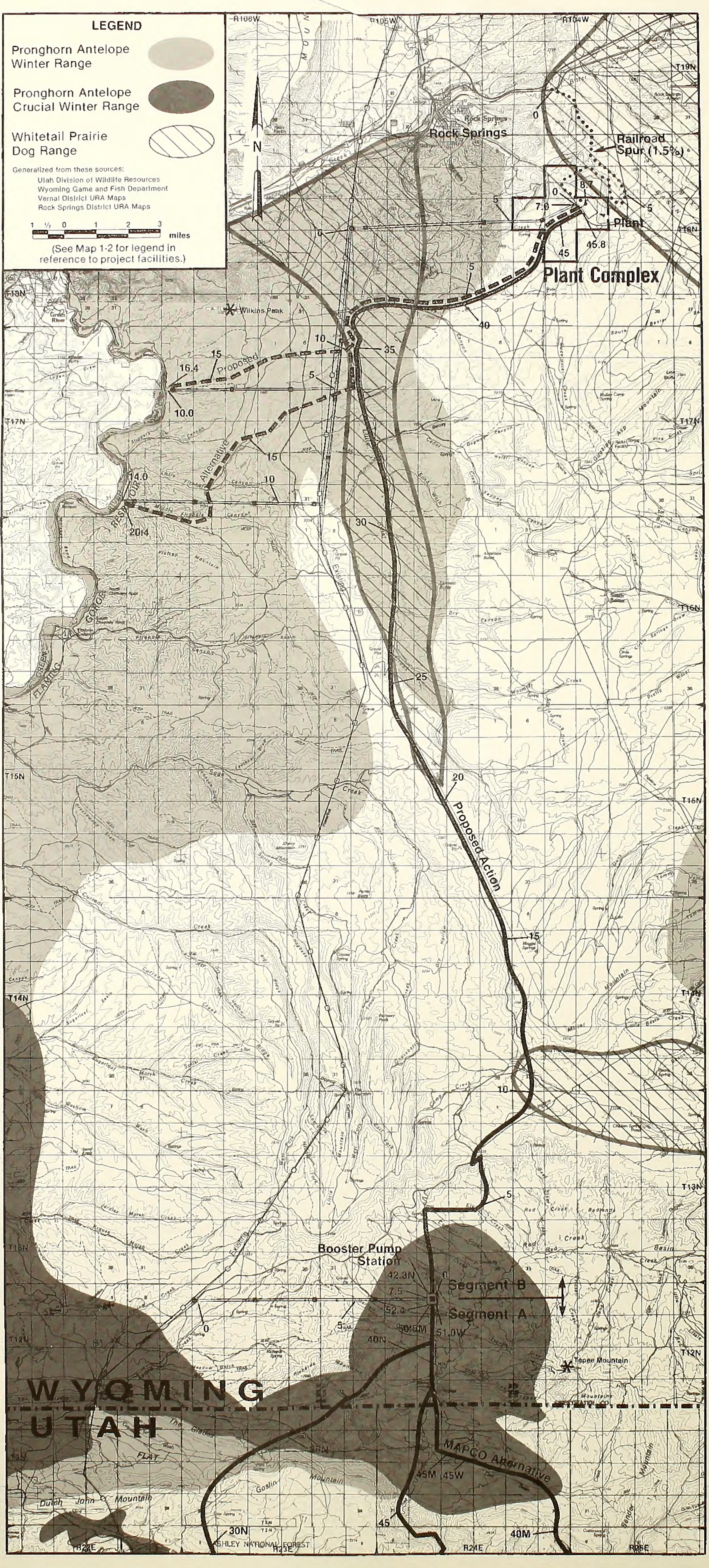


PROJECT DETAILS AND SECTION LINES ARE APPROXIMATE

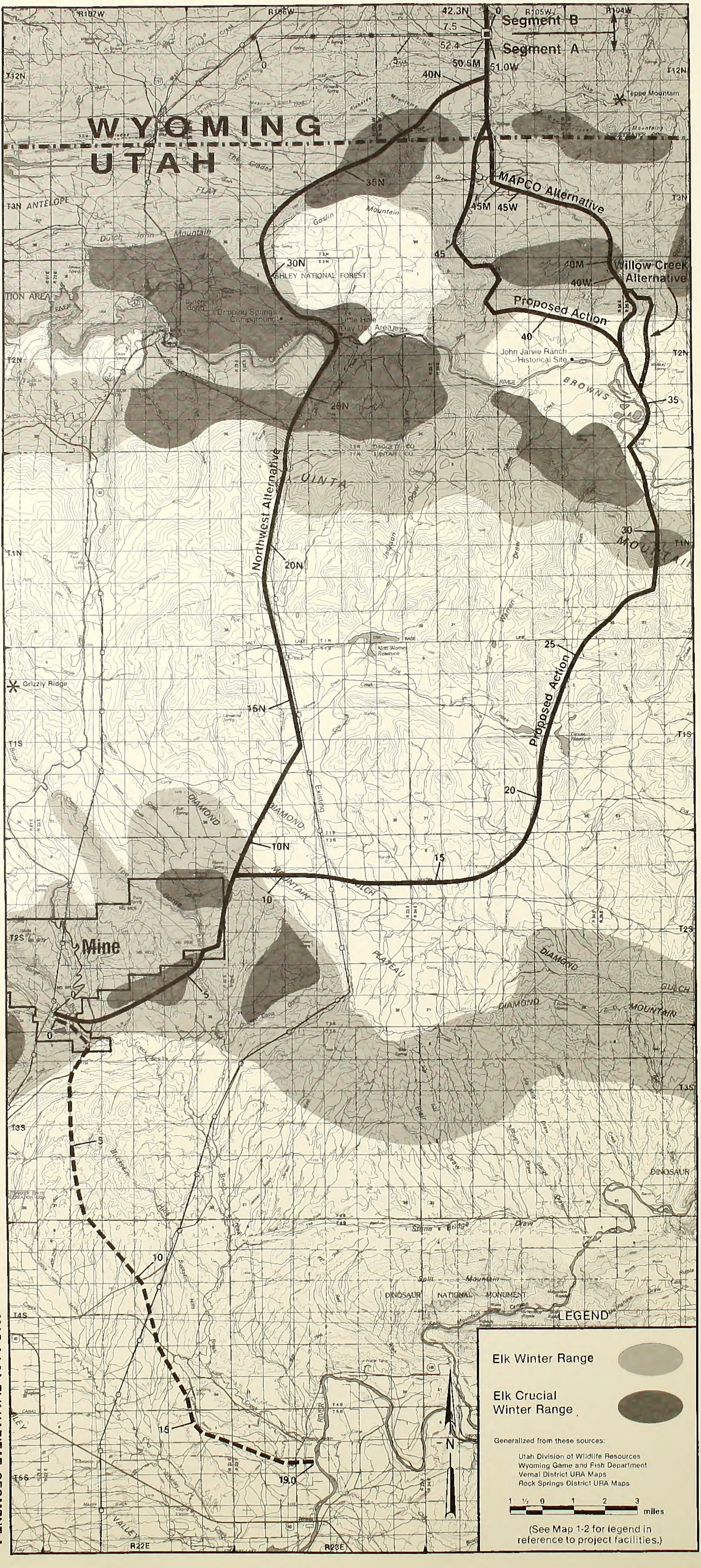
MAP A4-6 WILLOW CREEK ISSUE AREA



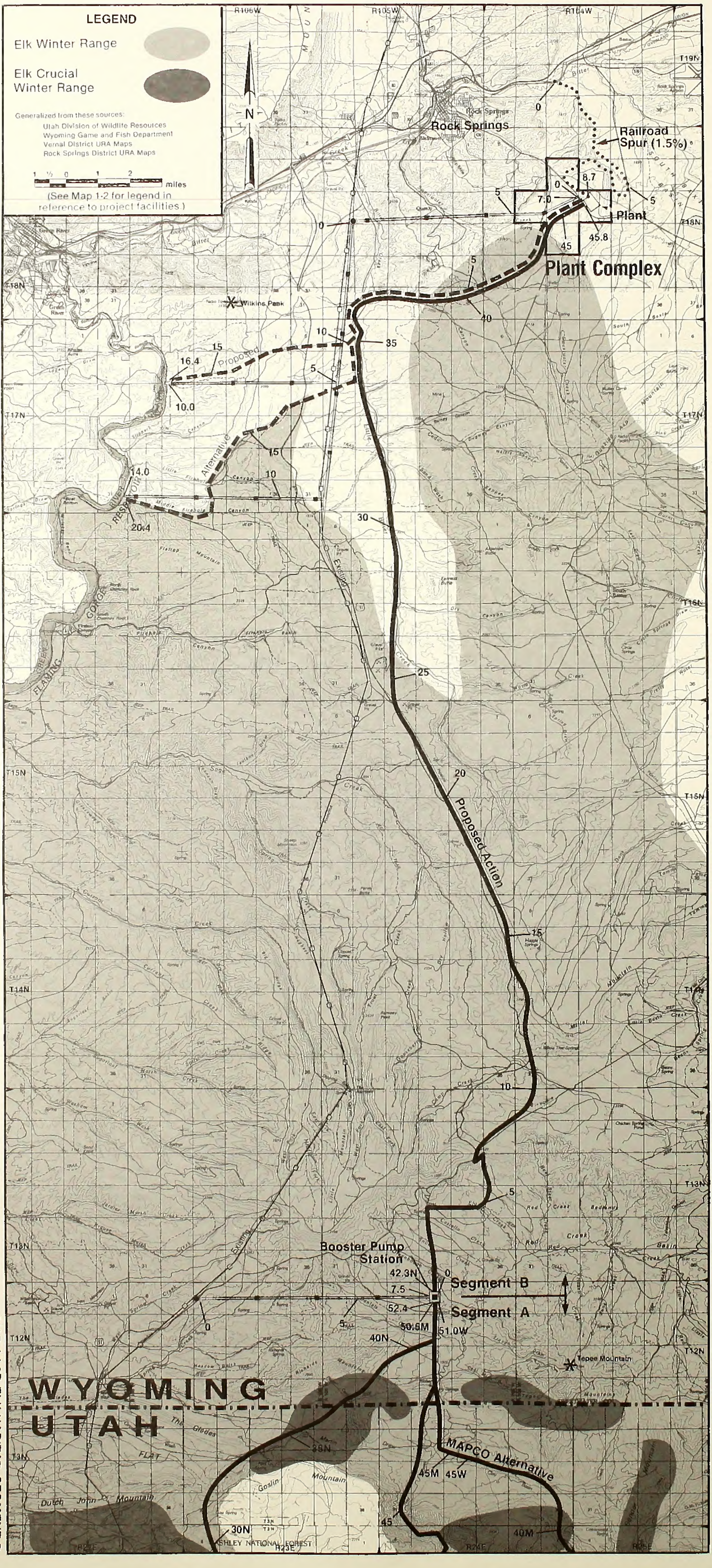
MAP A4-7A PRONGHORN ANTELOPE AND WHITETAIL PRAIRIE DOG HABITAT, SEGMENT A



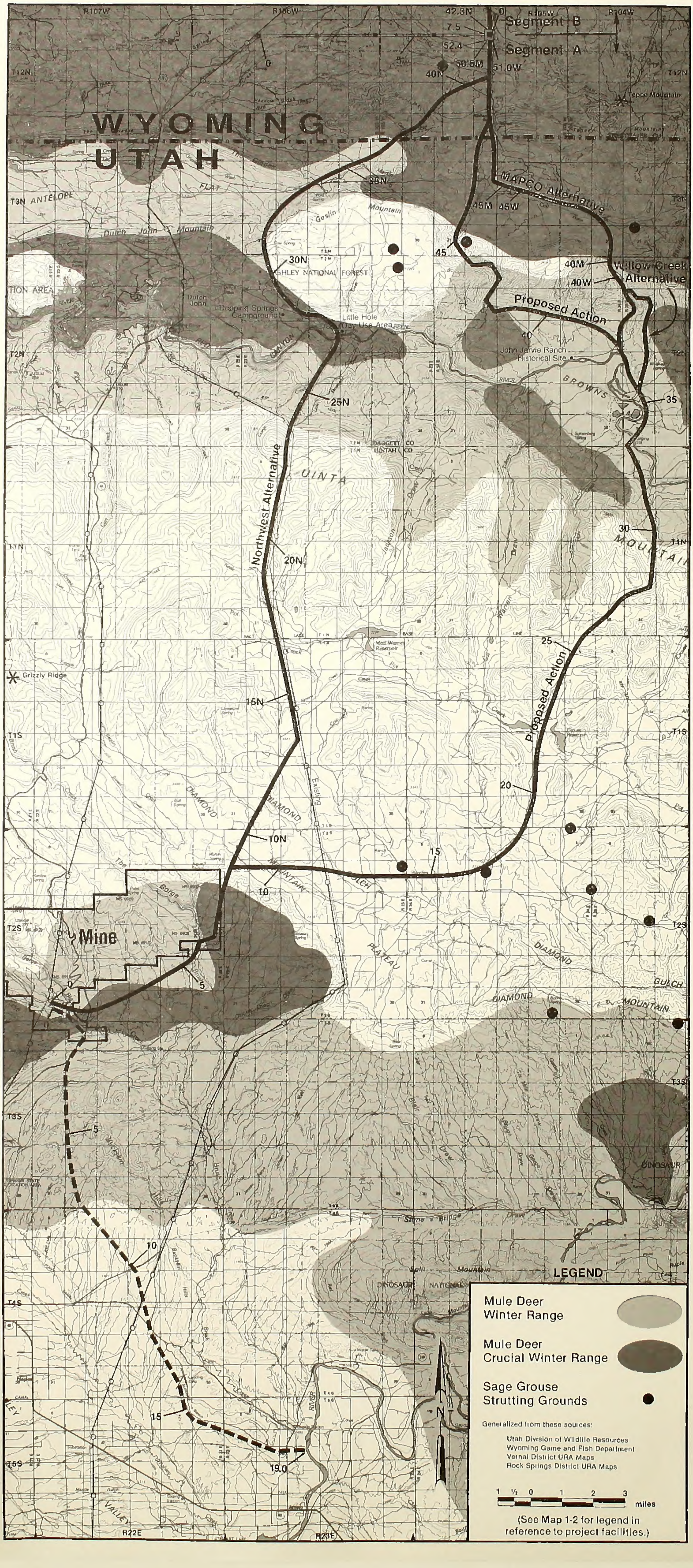
MAP A4-7B PRONGHORN ANTELOPE AND WHITETAIL PRAIRIE DOG HABITAT, SEGMENT B



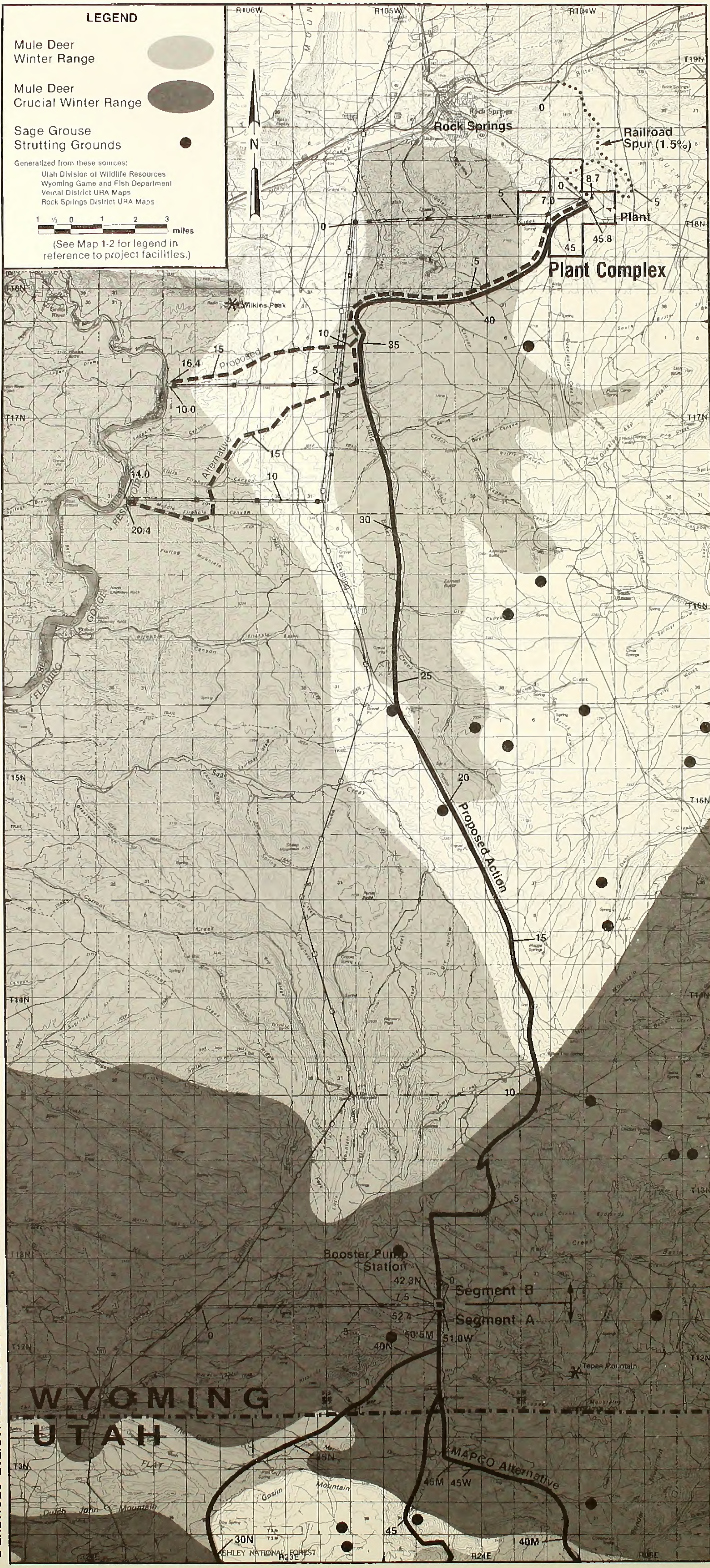
MAP A4-8A ELK HABITAT, SEGMENT A



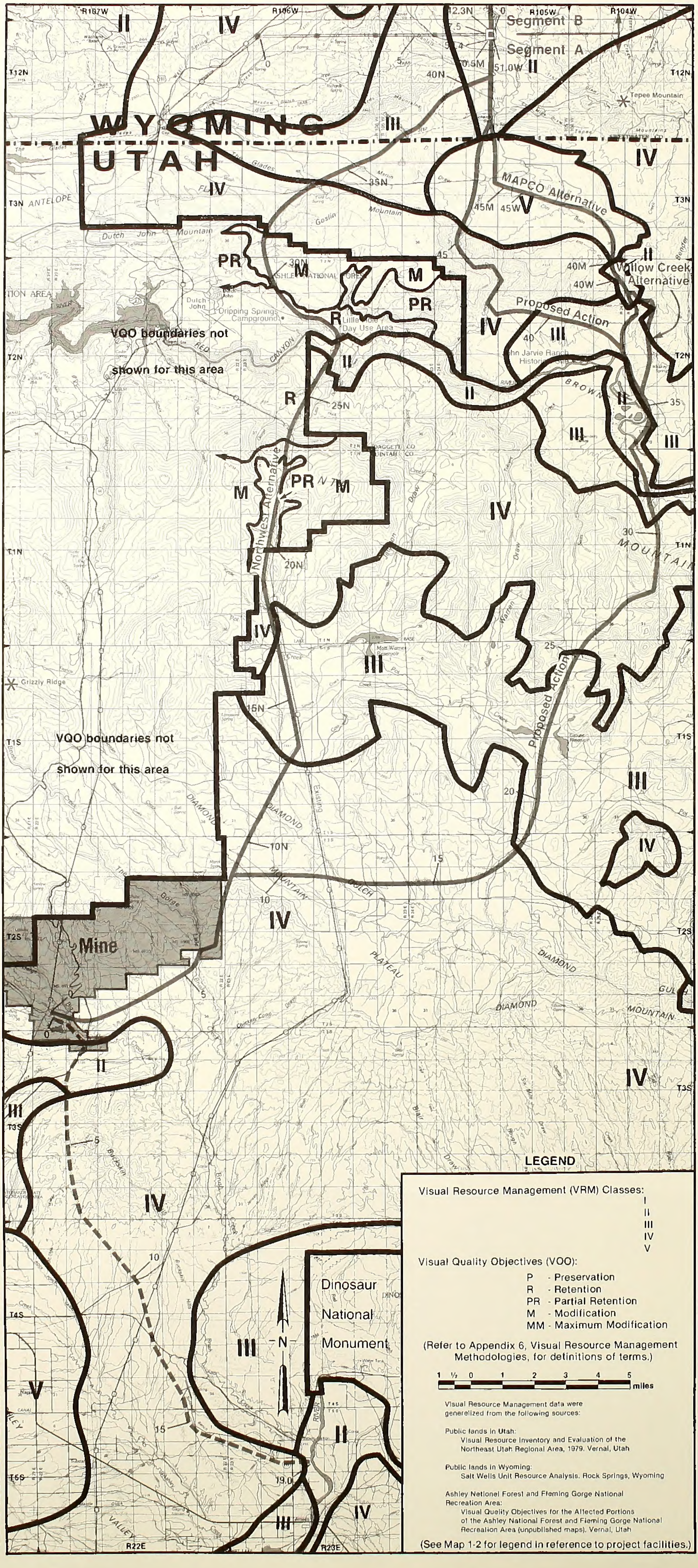
MAP A4-8B ELK HABITAT, SEGMENT B



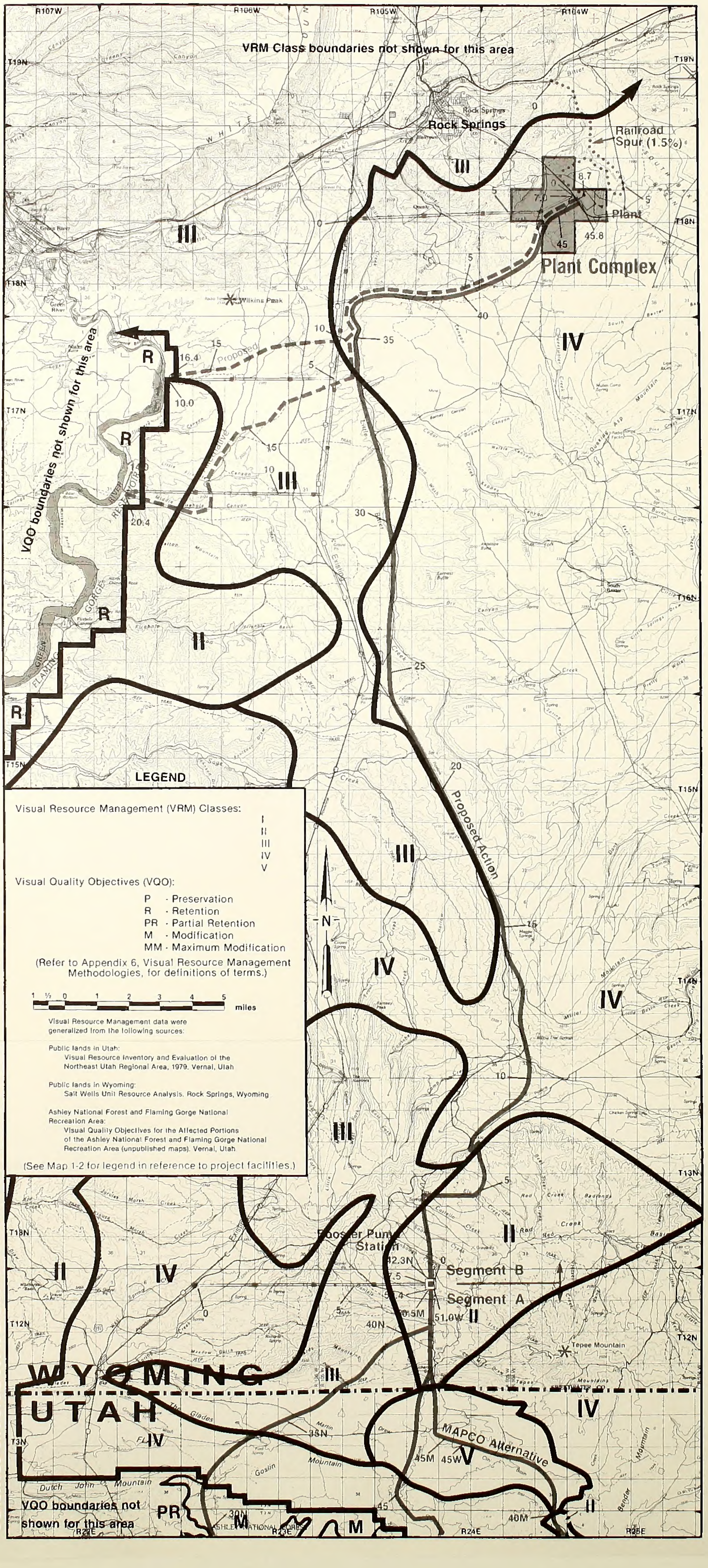
MAP A4-9A MULE DEER AND SAGE GROUSE HABITAT, SEGMENT A



MAP A4-9B MULE DEER AND SAGE GROUSE HABITAT, SEGMENT B



MAP A4-10A VISUAL RESOURCE MANAGEMENT CLASSIFICATIONS, SEGMENT A



MAP A4-10B VISUAL RESOURCE MANAGEMENT CLASSIFICATIONS, SEGMENT B

Bureau of Land Management
Library
Bldg. 50 Denver Federal Center
Denver, CO 80225

PUBLIC HEARINGS REGISTRATION FORM

First public hearings on the draft Chevron Phosphate Fertilizer Complex Environmental Impact Statement.

(Please Print)

To: Richard E. Traylor, Division of EIS Services, First Floor East, 555 Zang Street, Denver, Colorado 80228

From: Name ______________________________

Street Address ______________________________

City, State ____________ ____________ Zip Code ____________

Representing ______________________________

I wish to appear at the ____________ public hearing on ____________
(town)
1983, afternoon ( ) evening session ( ) to express my views on the adequacy of the EIS.

I intend to submit written documentation:Yes ____________ No ____________

____
Signature

Verbal testimony will be limited to 10 minutes; written testimony will be accepted at the above address until close of business on March 15, 1983. Registration forms are to be submitted by February 11, 1983. Registration will also be accepted at the door for each hearing.

☆U.S. GOVERNMENT PRINTING OFFICE:1983—576-053 / 40

Form 1279–3
(June 1984)

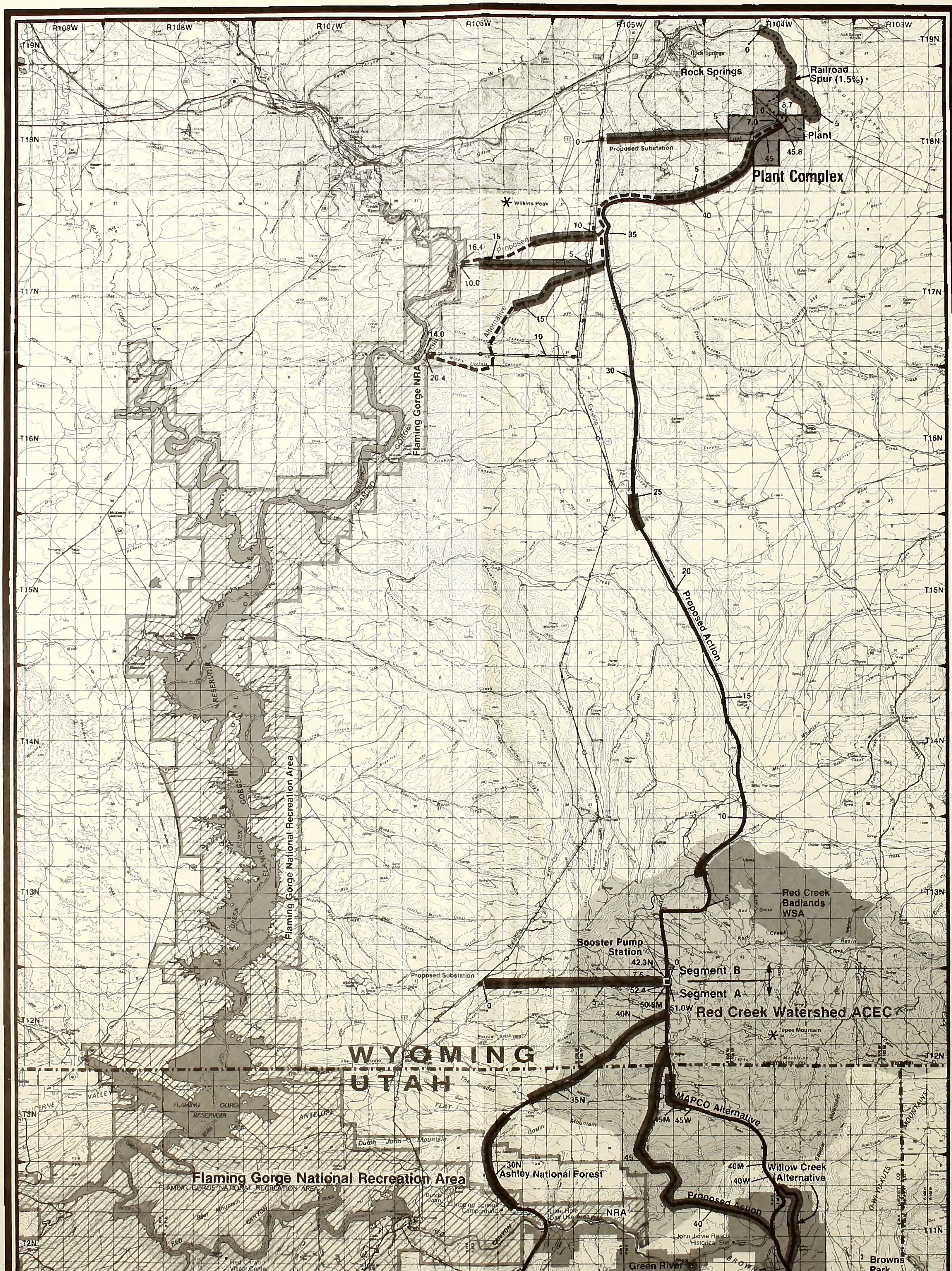
BORROWER'S

TD 195 .F46 C48 1983

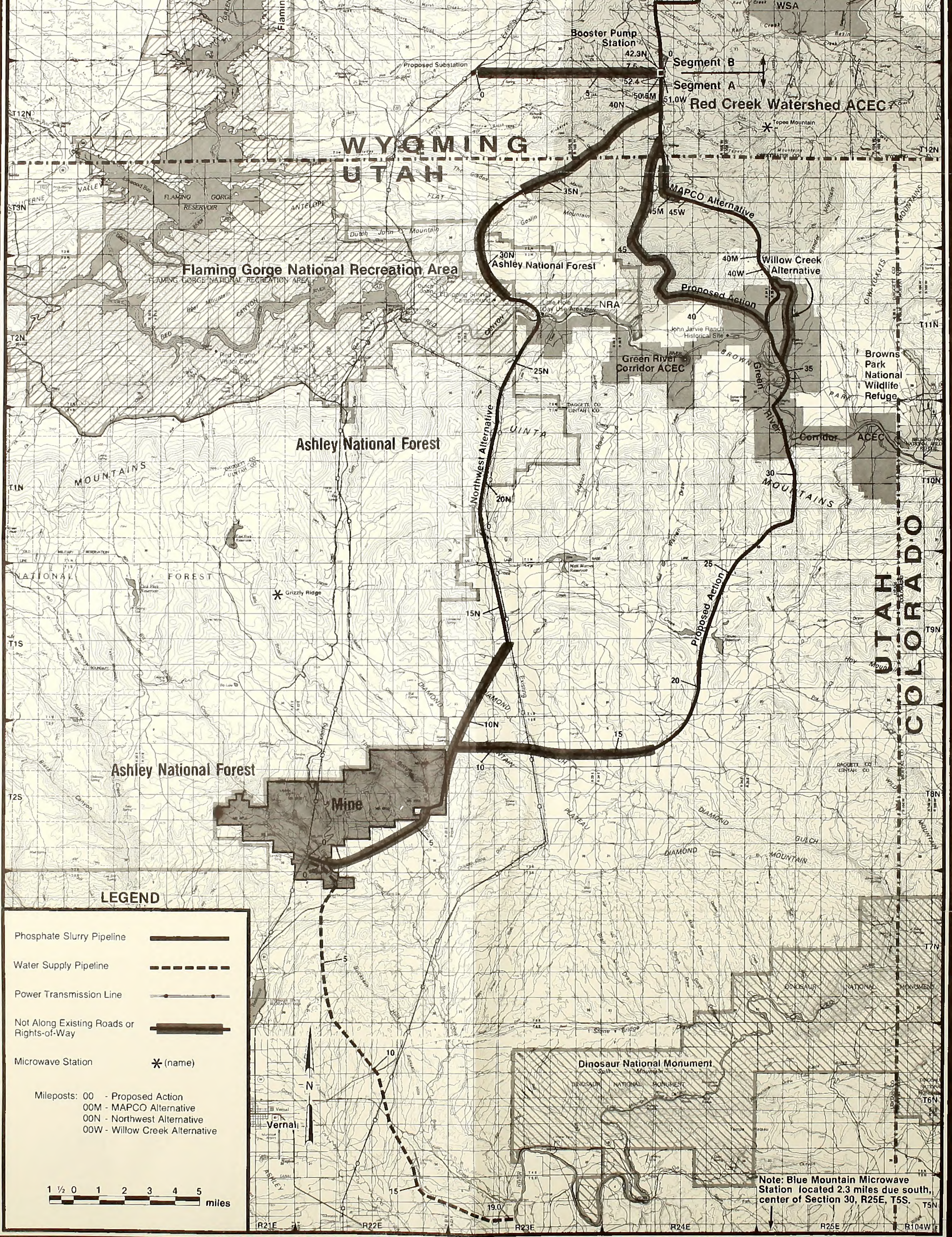
Draft environmental
statement on the Ch

DATE LOANED	BORROWER

USDI – BLM



R109W
R108W
R107W
R106W
R105W
R104W
R103W
T19N
T18N
T17N
T16N
T15N
T14N
T13N
T12N
Rock Springs
Railroad Spur (1.5%)
Plant
Plant Complex
Proposed Substation
Wilkins Peak
Proposed
Alternative
Flaming Gorge NRA
Proposed Action
Red Creek Badlands WSA
Booster Pump Station
Segment B
Segment A
Red Creek Watershed ACEC
Tepee Mountain
Proposed Substation
WYOMING
UTAH
MAPCO Alternative
Willow Creek Alternative
Proposed Action
Flaming Gorge National Recreation Area
Ashley National Forest
Flaming Gorge National Recreation Area
FLAMING GORGE RESERVOIR
John Jarvie Ranch Historical Site
Browns Park
Green River



MAP 1-2 CHEVRON PHOSPHATE PROJECT

Bureau of Land Management Library Bldg. 50, Denver Federal Center Denver, CO 80225

BLM-YA-ES-83-001