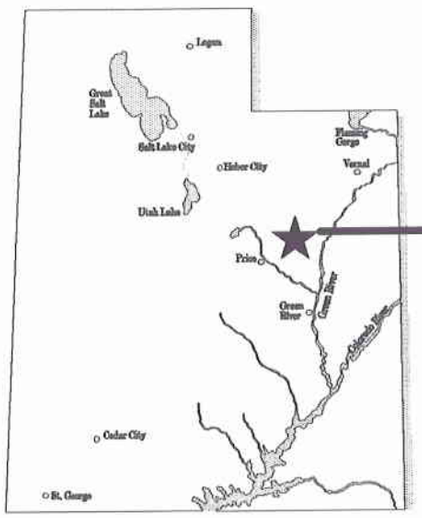
SUNNYSIDE COGENERATION ASSOCIATES

Permit Application (PRO/007/035)



SUPERSEDED

FEB 04 2003

DIV OF OIL GAS & MINING

Book Five A
Chapter Eight - Plates

Eckhoff, Watson and Preator Engineering

in conjunction with Callister, Duncan & Nebeker

APPLICATION FOR PERMIT RIGHTS
(ACT/007-035)

RECEIVED
JUL 12

BOOK FIVE A

Prepared for:

Sunnyside Cogeneration Associates

Prepared by:

Eckhoff, Watson and Preator Engineering
1121 East 3900 South, Suite C-100
Salt Lake City, Utah 84124

In conjunction with:

Callister Duncan & Nebeker
Suite 800 Kennecott Building
Salt Lake City, Utah 84133

APPLICATION FOR PERMIT RIGHTS
(ACT/007-035)

RECEIVED
JUL 12

BOOK FIVE A

Prepared for:

Sunnyside Cogeneration Associates

Prepared by:

Eckhoff, Watson and Preator Engineering
1121 East 3900 South, Suite C-100
Salt Lake City, Utah 84124

In conjunction with:

Callister Duncan & Nebeker
Suite 900 Kennecott Building
Salt Lake City, Utah 84133

TABLE OF CONTENTS

BOOK ONE

CHAPTER ONE

R645-301-100 GENERAL CONTENTS
R645-301-110 Minimum Requirements for Legal, Financial, Compliance and Related Information 100-1
R645-301-130 Reporting of Technical Data 100-10
R645-301-140 Maps and Plans 100-10
R645-301-150 Completeness 100-10

LIST OF FIGURES

Figure 1-1, Certificate of Liability Insurance
Figure 1-2, Form For Advertisement of Application Filing
Figure 1-3, Proof of Publication of Newspaper Advertisements
Figure 1-4, Corporate Structure
Figure 1-5, Notarized Signature

APPENDICES

Appendix 1-1, AML Fee Requirement Correspondence

LIST OF PLATES

Plate 1-1, SCA Permit Area Legal Description and SCA Lease Area Boundary 9-30-94

CHAPTER TWO

R645-301-200 SOILS
R645-301-210 Introduction 200-1
R645-301-220 Environmental Description 200-2
R645-301-230 Operation Plan 200-4
R645-301-240 Reclamation Plan 200-7
R645-301-250 Performance Standards 200-8

TABLE OF CONTENTS (cont'd)

BOOK ONE

LIST OF FIGURES

Figure 2-1, Prime Farmland Determination

APPENDICES

Appendix 2-1, Description of Soil Mapping Units
Appendix 2-2, Description of Soil Series
Appendix 2-3, Revegetation Test Plot Study Report, 1982
Appendix 2-4, Reclamation Soil Borrow Area 1
Appendix 2-5, Borrow Area Sampling Results
Appendix 2-6, Revegetation Test Plot Design
Appendix 2-7, Slurry Pond Topsoil Sampling Results
Appendix 2-8, Order One Soil Survey of Proposed Disturbed Sites and Borrow Areas
Appendix 2-9, Soil Borrow Material Report, Sunnyside Cogeneration Associates Permit Site; ACZ, Inc., August 1993
Appendix 2-10, Old Coarse Refuse Road Reclamation Soil Analysis

LIST OF PLATES

Plate 2-1, Soil Identification Map 9-30-94

CHAPTER THREE

R645-301-300 BIOLOGY
R645-301-310 Introduction 300-1
R645-301-320 Environmental Description 300-2
R645-301-330 Operation Plan 300-14
R645-301-340 Reclamation Plan 300-15
R645-301-350 Reclamation Performance Standards 300-16

LIST OF FIGURES

Figure 3-1, Plots of Effective and Annual Sunnyside Precipitation
Figure 3-2, Threatened and Endangered Species List for the SCA Permit Area
Figure 3-3, OSM Determination of Federal Action
Figure 3-4, Biological Assessment for the Bald Eagle Associated with the Sunnyside Cogeneration Project Environmental Impact Statement PA93-1 and Biological Consideration for other Sensitive Species
Figure 3-5, SCS Reference Areas and Overall Land Productivity Assessment

TABLE OF CONTENTS (cont'd)

BOOK ONE

LIST OF TABLES

Table 3-1, Value of Revegetation Species to Deer and Elk for the Sunnyside Mine
Table 3-2, Ranking of Value per Ecological Association for Wildlife Habitats having High Interest
Table 3-3, Characteristics of Species Used in Seed Mixtures

APPENDICES

Appendix 3-1, Riparian Vegetation Discussion
Appendix 3-2, Iron and TDS Report
Appendix 3-3, Reference Area Survey Results
Appendix 3-4, Fish Inventory Survey Information
Appendix 3-5, Sunnyside Coal Mine Vegetation Monitoring Report

LIST OF PLATES

Plate 3-1, Pre-Law, Post-Law and Future (Anticipated) Disturbed Areas, 300' scale 9-30-94
Plate 3-1A, Pre-Law, Post-Law and Future (Anticipated) Disturbed Areas, 100' scale 3-94
Plate 3-1B, Pre-Law, Post-Law and Future (Anticipated) Disturbed Areas, 100' scale 4-94
Plate 3-1C, Pre-Law, Post-Law and Future (Anticipated) Disturbed Areas, 100' scale 3-94
Plate 3-1D, Pre-Law, Post-Law and Future (Anticipated) Disturbed Areas, 100' scale 9-30-94
Plate 3-1E, Pre-Law, Post-Law and Future (Anticipated) Disturbed Areas, 100' scale 9-30-94
Plate 3-2, Wildlife Resource Map
Plate 3-3, Vegetation Resource Map 9-30-94

BOOK TWO

CHAPTER FOUR

R645-301-400 LAND USE AND AIR QUALITY
R645-301-410 Land Use 400-1
R645-301-420 Air Quality 400-12

TABLE OF CONTENTS (cont'd)

BOOK TWO

LIST OF FIGURES

Figure 4-1, Survey Locations
Figure 4-2, Average Monthly Nonagricultural Payroll Wages in Utah
Figure 4-3, SCA Understanding of Reclamation Activities

APPENDICES

Appendix 4-1, Site Descriptions
Appendix 4-2, Air Quality Permit, Division of Air Quality
Appendix 4-3, Historic and Cultural Site Listings - Letter from SHPO
Appendix 4-4, Local Zoning Ordinances

LIST OF PLATES

Plate 4-1, Surface Ownership Plat
Plate 4-2, Survey Areas and Site Locations 9-15-93
Plate 4-3, Sensitivity Zones
Plate 4-4, Existing Land Use 9-15-93
Plate 4-5, Cogeneration Facility 5-20-94

CHAPTER FIVE

R645-301-500 GENERAL ENGINEERING
R645-301-510 Introduction 500-1
R645-301-520 Operation Plan 500-7
R645-301-530 Operational Design Criteria and Plans 500-18
R645-301-540 Reclamation Plan 500-20
R645-301-550 Reclamation Design Criteria and Plans 500-20
R645-301-560 Performance Standards 500-21

LIST OF FIGURES

Figure 5-1, Side View of Coal Mine Waste Excavation

LIST OF TABLES

Table 5-1, Inspection Schedule for the Excess Spoil Pile, Refuse Pile and All Impoundments

TABLE OF CONTENTS (cont'd)

BOOK TWO

APPENDICES

Appendix 5-1, Slope Stability Analysis of Sedimentation Ponds
Appendix 5-2, Geotechnical Investigation of Slurry Impoundments (Dames and Moore)
Appendix 5-3, Stability Analysis (Rollins, Brown and Gunnell, Inc.
Appendix 5-4, Stability Analysis (Rollins, Brown and Gunnell, Inc.)
Appendix 5-5, Coal Refuse Pile Geotechnical Report
Appendix 5-6, In-Place Density Determination for the Coarse Refuse Pile
Appendix 5-7, Road Descriptions

LIST OF PLATES

Plate 5-1, Surface Facilities, 300' scale	9-30-94
Plate 5-1A, Surface Facilities, 100' scale	9-30-94
Plate 5-1B, Surface Facilities, 100' scale	9-30-94
Plate 5-1C, Surface Facilities, 100' scale	9-30-94
Plate 5-1D, Surface Facilities, 100' scale	9-30-94
Plate 5-1E, Surface Facilities, 100' scale	9-30-94
Plate 5-2, Road Classification Map	9-30-94
Plate 5-2 (A-B), Preliminary Typical Road Cross-sections	3-94
Plate 5-2 (C-G), Road Plan and Profile	3-94
Plate 5-2H, Road "B" Plan and Profile	9-30-94
Plate 5-2J, Road "N", Road "M", Road "P", and Road "R" Plan and Profile	9-30-94
Plate 5-3, Access Road Drawing	9-30-94
Plate 5-4, Slope Stability Criteria Map	11-5-93
Plate 5-5A, Coarse Refuse Toe/Railcut Topsoil Stockpiles	9-30-94
Plate 5-5B, Slurry Pond/Hoist House Topsoil Stockpiles	9-30-94
Plate 5-5C, New (Lower) Haul Road/Clear Water Pond Topsoil Stockpiles	9-30-94
Plate 5-5D, Access Road/Borrow Area Topsoil Stockpiles	9-30-94
Plate 5-5E, Storage Area #1 Topsoil Stockpile	9-30-94
Plate 5-6, Existing Refuse Piles with Limits of Slurry Cells	9-15-93
Plate 5-7, Previously-Mined Areas	7-11-94
Plate 5-8, Existing Surface and Subsurface Facilities and Features (Prior to January 21, 1981)	9-30-94

TABLE OF CONTENTS (cont'd)

BOOK THREE

CHAPTER SIX

R645-301-600 GEOLOGY
R645-301-610 Introduction 600-1
R645-301-620 Environmental Description 600-3
R645-301-630 Operation Plan 600-11
R645-301-640 Performance Standards 600-11

LIST OF FIGURES

Figure 6-1, Generalized Lithologic Section
Figure 6-2, Stratigraphic Relationship Sunnyside Mining District
Figure 6-3, Typical Section of Sunnyside Coal Property
Figure 6-4, Coal Sample Analyses

APPENDICES

Appendix 6-1, Sunnyside Cogeneration Facility: Phase I - Independent Engineer Due Diligence Review, Fuel Study Subconsultant Services, Sunnyside Refuse Area Drilling Program, and Evaluation of the Quantity and Quality of Material in the Sunnyside Refuse Area
Appendix 6-2, Evaluation of the Water Rights for the Proposed Sunnyside Cogeneration Project, and the Quality and Quantity of Coal Refuse Piles, Sunnyside and Wellington, Utah
Appendix 6-3, Special Coarse Refuse Use Study Report
Appendix 6-4, State of Utah Administrative Rules for Water Well Drillers Rule 12 and Appendix I
Appendix 6-5, Drilling and Sample Collection and Monitoring Well Installation, West Slurry Cell and Coarse Refuse Pile
Appendix 6-6, Preliminary Analysis of Surface Soil Samples for Potential Acid/Toxic-Forming Materials, West Slurry Cell

LIST OF PLATES

Plate 6-1, Borehole Sample Locations 6-30-93
Plate 6-2, Hydrogeologic Index Map
Plate 6-3, Index Map for Cross-Sections 9-15-93
Plate 6-4, Geologic Cross Section A-A'
Plate 6-5, Geologic Cross Section B-B'
Plate 6-6, Geologic Cross Section C-C'

TABLE OF CONTENTS (cont'd)

BOOK FOUR

CHAPTER SEVEN

R645-301-700 HYDROLOGY

R645-301-710 Introduction 700-1
R645-301-720 Environmental Description 700-3
R645-301-730 Operation Plan 700-12
R645-301-740 Design Criteria and Plans 700-18
R645-301-750 Performance Standards 700-23
R645-301-760 Reclamation 700-24

LIST OF FIGURES

Figure 7-1, Appropriation Certificate of East Carbon City Water Well
Figure 7-2, Underground Water Rights Search

APPENDICES

Appendix 7-1, UPDES Permit
Appendix 7-2, Climatology Data from the Utah Climate Center
Appendix 7-3, Hydrologic Design of Sediment Ponds
Appendix 7-4, Baseline Water Quality Data
Appendix 7-5, Special Coarse Refuse Use Study Report
Appendix 7-6, Coarse Refuse Seep Water Quality Results
Appendix 7-7, Hydrologic Data for Areas not Served by a Sediment Pond
Appendix 7-8, Operational (UPDES) Water Monitoring and Baseline Water Monitoring Schedules

*LIST OF TABLES

Table 7-1A, Operational (UPDES) Water Monitoring Locations
Table 7-1B, Operational (UPDES) Water Quality Monitoring Parameters
Table 7-2A, Baseline Water Monitoring Locations
Table 7-2B, Baseline Water Monitoring Quality Parameters

*All tables for Chapter Seven are included in Appendix 7-8, Operational (UPDES) Water Monitoring and Baseline Water Monitoring Schedules.

TABLE OF CONTENTS (cont'd)

BOOK FOUR A

LIST OF PLATES

Plate 7-1, Hydrologic Index Map	9-30-94
Plate 7-1A, Pasture Pond Drainage	5-20-94
Plate 7-1B, Old Coarse Refuse Road Pond Drainage	9-30-94
Plate 7-1C, Coarse Refuse Toe Pond Drainage	9-30-94
Plate 7-1D, Railcut Pond Drainage	4-25-94
Plate 7-2, Baseline Water Monitoring Points	
Plate 7-3, Operational (UPDES) Water Monitoring Points	5-94
Plate 7-4, Coal Slurry Water Sediment Control System	11-16-93
Plate 7-5, Slurry Ditch and Surrounding Areas Drainage Patterns	11-16-93
Plate 7-6, Diversion and Culvert Locations	6-29-94
Plate 7-7, Coarse Refuse Toe Sediment Pond Record Drawing	10-93
Plate 7-8, Railcut Pond and Topsoil Pile Record Drawing	10-93
Plate 7-9, Pasture Pond Record Drawing	9-15-93
Plate 7-10, Old Coarse Refuse Road Sediment Pond Record Drawing	9-15-93
Plate 7-11, Borrow Area Sediment Pond Record Drawing	11-16-93
Plate 7-11B, Borrow Area Pond Drainage	11-16-93
Plate 7-12, East and West Slurry Cell Record Drawing	12-8-93
Plate 7-13, Coarse Refuse Toe Sediment/Rail Cut Sediment Pond Cross-sections	10-93
Plate 7-14, Old Coarse Refuse Road/Pasture Sediment Pond Cross-sections	9-15-93
Plate 7-15, Borrow Area and Clear Water Pond Cross-sections	11-16-93
Plate 7-16, East and West Slurry Cell Cross-sections	12-8-93
Plate 7-17, Slurry Ponds #1 and #2 Cross-sections	11-16-93
Plate 7-18, Coal Pile Sediment Pond and Cross-section	6-3-94
Plate 7-19, Typical Flow Measuring Devices	4-1-94

BOOK FIVE

CHAPTER EIGHT

R645-301-800 BONDING AND INSURANCE

R645-301-820 Requirement to File Bond 800-1
R645-301-830 Determination of Bond Amount 800-1
R645-301-890 Terms and Conditions for Liability Insurance 800-1

TABLE OF CONTENTS (cont'd)

BOOK FIVE

LIST OF FIGURES

Figure 8-1, Certificate of Public Liability Insurance

*LIST OF TABLES

Table 8-1, Phase I and Phase II Reclamation Cost and Time Summary
Table 8-2, Phase I and Phase II Mobilization
Table 8-3, Phase I Demolition of Crusher Facility Cost and Time Estimate
Table 8-4, Phase I Culvert Removal Cost and Time Estimate
Table 8-5, Phase I Pond Reclamation Cost and Time Estimate
Table 8-6, Phase I General Earthwork Cost and Time Estimate
Table 8-7, Phase I Revegetation Cost and Time Estimate
Table 8-8, Phase II Culvert Removal Cost and Time Estimate
Table 8-9, Phase II Pond Reclamation Cost and Time Estimate
Table 8-10, Phase II General Earthwork Cost and Time Estimate
Table 8-11, Phase II Revegetation Cost and Time Estimate

*All tables for Chapter Eight are included in Appendix 8-2, Bond Estimate Verification

APPENDICES

Appendix 8-1, Worst Case Scenario Reclamation Hydrology Plan
Appendix 8-2, Bond Estimate Verification

BOOK FIVE A

LIST OF PLATES

Plate 8-1 (A-E), Worst Case Scenario - Phasing Plans 7-11-94
Plate 8-2 (A-E), Worst Case Scenario - Rough Grading Plans 7-11-94
Plate 8-3 (A-E), Worst Case Scenario - Drainage Areas and Diversions Plans 7-11-94
Plate 8-4, Worst Case Scenario - Borrow Material Plan 7-11-94
Plate 8-5, Worst Case Scenario - Seeding Plan 7-11-94

TABLE OF CONTENTS (cont'd)

BOOK SIX

CHAPTER NINE

9.1 Mining Plans 900-1
9.2 Description of Present Disturbance 900-2
9.3 Reclamation Accomplished to Date 900-2
9.4 General Reclamation Objectives 900-2
9.5 Areas to Be Reclaimed and Planned Reclamation 900-3
9.6 Excavation and Disposal of Coal Mine Material 900-3
9.6.1 Coarse Refuse 900-5
9.6.2 Fine Refuse 900-6
9.6.3 Temporary Storage Areas 900-6
9.6.4 General Refuse Handling Procedures 900-10
9.6.5 Final Disposal of Waste Material (Excess Spoil and Coal Mine Waste) 900-11
9.7 Backfilling and Grading 900-17
9.8 Topsoil and Borrow Material Handling 900-18
9.8.1 Areas to Receive Topsoil or Borrow Material 900-18
9.8.2 Borrow Material Removal 900-19
9.8.3 Topsoil Storage 900-19
9.8.4 Topsoil and Borrow Material Redistribution 900-20
9.8.5 Amendments 900-20
9.9 Revegetation 900-20
9.9.1 General Revegetation Procedures 900-20
9.9.2 Interim Revegetation 900-22
9.9.2.1 Interim Reclamation of the Third Lift of The Coarse Refuse Pile 900-22
9.9.3 Seeding and Planting 900-23
9.9.4 Mulching and Soil Stabilization 900-24
9.9.5 Vegetation Success Determination 900-24
9.9.6 Sampling Procedures 900-25
9.9.7 Irrigation 900-26
9.10 Water Treatment 900-26
9.10.1 Diversions 900-26
9.10.2 Sediment Control 900-26
9.11 Monitoring and Maintenance 900-26
9.11.1 Water 900-26
9.11.2 Vegetation 900-27
9.11.3 Erosion 900-27
9.11.4 Temporary Storage Areas 900-27
9.11.5 Reporting and Emergency Procedures 900-28
9.12 Schedule 900-28

TABLE OF CONTENTS (cont'd)

BOOK SIX

LIST OF FIGURES

Figure 9-1, Interim Reclamation Seed Mixture
Figure 9-2, SCA Mining Process

APPENDICES

Appendix 9-1, Draft Coarse Refuse Pile Fuel Study and Mining Plan, John T. Boyd
Appendix 9-2, Geotechnical Consultation - Excess Spoil Pile Area, SHB-AGRA, Inc.
Appendix 9-3, Sunnyside Coal Refuse Drilling Programs and Evaluation of the Quantity and Quality of Fuel Material in the Sunnyside Coal Refuse Pile
Appendix 9-4, Storage Area One Soil Sample Testing Results
Appendix 9-5, Excess Spoil Disposal Area Design
Appendix 9-6, Mine Quantity Calculations, Years 1-5

PLATES

Plate 9-1A, Excess Spoil Disposal Area Design - Natural Ground	9-30-94
Plate 9-1B, Excess Spoil Disposal Area Design - Final Surface Configuration	9-30-94
Plate 9-1C, Excess Spoil Disposal Area Design - Cross-Sections	9-30-94
Plate 9-1D, Excess Spoil Disposal Area Design - Drainage Areas and Diversions	9-30-94
Plate 9-2, Storage Area Design	8-93
Plate 9-3, Reclamation Sequencing	9-15-93
Plate 9-4, Mine Sequencing - Years 1 thru 5	9-30-94
Plate 9-4A, Mine Sequencing Sections - Year 1	9-30-94
Plate 9-4B, Mine Sequencing Sections - Year 2	9-30-94
Plate 9-4C, Mine Sequencing Sections - Year 3	9-30-94
Plate 9-4D, Mine Sequencing Sections - Year 4	9-30-94
Plate 9-4E, Mine Sequencing Sections - Year 5	9-30-94
Plate 9-5, Mine Sequencing - Years 6 thru 10	9-30-94
Plate 9-6, Mine Sequencing - Years 11 thru 20	9-30-94
Plate 9-7, Areas of Permanent Mining Activity	9-30-94

TABLE OF CONTENTS (cont'd)

BOOK SIX

CHAPTER TEN

10.1 Introduction 1000-1
10.2 Proposed Post-Mining Land Use 1000-1
10.3 Schedule 1000-1
10.4 Excavation of Coal Materials 1000-1
10.4.1 Old Coarse Refuse Road Reclamation 1000-1
10.5 Backfilling and Grading 1000-2
10.5.1 Old Coarse Refuse Road Reclamation 1000-2
10.6 Drainage Control 1000-4
10.6.1 Drainage Plan 1000-4
10.6.1.1. Old Coarse Refuse Road Reclamation 1000-4
10.6.2 Sediment Control 1000-4
10.6.2.1. Old Coarse Refuse Road Reclamation 1000-4
10.7 Topsoil and Borrow Material Handling 1000-5
10.8 Revegetation 1000-5
10.8.1 Old Coarse Refuse Road Reclamation 1000-5
10.9 Environmental Monitoring and Maintenance 1000-5

LIST OF FIGURES

Figure 10-1, Final Reclamation Schedule

LIST OF PLATES

Plate 10-1, Post Mining Reclamation Plan 6-29-94
Plate 10-2A, Old Coarse Refuse Road-Existing Plan and Detail 6-29-94
Plate 10-2B, Old Coarse Refuse Road-Erosion Control Plan and Detail 4-25-94
Plate 10-2C, Old Coarse Refuse Road-Reclamation Plan and Detail 6-29-94