



## Sunnyside Cogeneration Associates

P.O. Box 10, East Carbon, Utah 84520 • (435) 888-4476 • Fax (435) 888-2538

C/007/035 Incoming  
#3893  
K

August 16, 2011

Daron Haddock  
Division of Oil Gas and Mining  
1594 West North Temple, Suite 1210  
Salt Lake City, UT 84116

RE: Sunnyside Cogeneration Associates, Sunnyside Refuse/Slurry, C007/035  
Excess Spoils Disposal Area #2 Amendment

Dear Mr. Haddock,

SCA's operations at the Sunnyside mining site have progressed to the point where it is necessary to submit the enclosed amendment to begin expansion of the Excess Spoils Disposal Area #2. We would like to begin placing spoil material in the proposed Phase 2 portion of the disposal area and prepare for reclamation of the Phase 1 portion.

The enclosed amendment includes design drawings for both Phase 2 and Phase 3 and updates to the reclamation drawings. It also includes amended text describing the design and reclamation work to occur in the disposal area. Updated bond calculations have been included to reflect the additional cover depth that will be needed.

We have enclosed three (3) copies of the permit amendment (drawings, tables, text pages and appendices) for your review. If you have any questions, please feel free to call Rusty Netz or myself at (435) 888-4476.

Thank You,

Richard Carter  
Agent For  
Sunnyside Cogeneration Associates

c.c. Steve Gross  
William Rossiter  
Maggie Estrada  
Paul Shepard  
Rusty Netz  
Plant File

RECEIVED  
AUG 18 2011  
DIV. OF OIL, GAS & MINING

# APPLICATION FOR COAL PERMIT PROCESSING

Permit Change  New Permit  Renewal  Exploration  Bond Release  Transfer

**Permittee:** Sunnyside Cogeneration Associates  
**Mine:** Sunnyside Refuse and Slurry **Permit Number:** C/007/035  
**Title:** Excess Spoil Disposal Area #2

**Description,** Include reason for application and timing required to implement:  
Add Phases 2 and 3 to the Excess Spoil Disposal Area #2 and prepare for reclamation of Phase 1 of the same

- Instructions:** If you answer yes to any of the first eight questions, this application may require Public Notice publication.
- Yes  No 1. Change in the size of the Permit Area? Acres: \_\_\_\_\_ Disturbed Area: 0.00  increase  decrease.
  - Yes  No 2. Is the application submitted as a result of a Division Order? DO# \_\_\_\_\_
  - Yes  No 3. Does the application include operations outside a previously identified Cumulative Hydrologic Impact Area?
  - Yes  No 4. Does the application include operations in hydrologic basins other than as currently approved?
  - Yes  No 5. Does the application result from cancellation, reduction or increase of insurance or reclamation bond?
  - Yes  No 6. Does the application require or include public notice publication?
  - Yes  No 7. Does the application require or include ownership, control, right-of-entry, or compliance information?
  - Yes  No 8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
  - Yes  No 9. Is the application submitted as a result of a Violation? NOV # \_\_\_\_\_
  - Yes  No 10. Is the application submitted as a result of other laws or regulations or policies?

*Explain:* \_\_\_\_\_

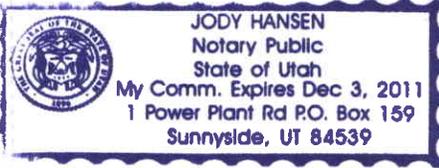
- Yes  No 11. Does the application affect the surface landowner or change the post mining land use?
- Yes  No 12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2)
- Yes  No 13. Does the application require or include collection and reporting of any baseline information?
- Yes  No 14. Could the application have any effect on wildlife or vegetation outside the current disturbed area?
- Yes  No 15. Does the application require or include soil removal, storage or placement?
- Yes  No 16. Does the application require or include vegetation monitoring, removal or revegetation activities?
- Yes  No 17. Does the application require or include construction, modification, or removal of surface facilities?
- Yes  No 18. Does the application require or include water monitoring, sediment or drainage control measures?
- Yes  No 19. Does the application require or include certified designs, maps or calculation?
- Yes  No 20. Does the application require or include subsidence control or monitoring?
- Yes  No 21. Have reclamation costs for bonding been provided?
- Yes  No 22. Does the application involve a perennial stream, a stream buffer zone or discharges to a stream?
- Yes  No 23. Does the application affect permits issued by other agencies or permits issued to other entities?
- Yes  No 24. Does the application include confidential information and is it clearly marked and separated in the plan?

**Please attach three (3) review copies of the application. If the mine is on or adjacent to Forest Service land please submit four (4) copies, thank you.** (These numbers include a copy for the Price Field Office)

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations herein.

RICHARD CARTER Plant Mgr. 8/15/11 [Signature]  
 Print Name Position Date Signature (Right-click above choose certify then have notary sign below)

Subscribed and sworn to before me this 15<sup>th</sup> day of August, 2011  
 Notary Public: Jody Hansen, state of Utah.  
 My commission Expires Dec. 31st 2011  
 Commission Number: 571930  
 Address: 1 Power Plant Rd. P.O. Box 159 Sunnyside  
 City: Sunnyside State: UT Zip: 84539



<p><b>For Office Use Only:</b></p>	<p><b>Assigned Tracking Number:</b></p>	<p><b>Received by Oil, Gas &amp; Mining</b></p> <p style="text-align: center; color: red; font-weight: bold; font-size: 1.2em;">RECEIVED</p> <p style="text-align: center; color: red; font-weight: bold; font-size: 1.2em;">AUG 18 2011</p> <p style="text-align: center; color: red; font-weight: bold; font-size: 1.2em;">DIV. OF OIL, GAS &amp; MINING</p>
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**APPENDIX 2-12**

**STORAGE AREA #3  
EXCESS SPOIL AREA #2 - PHASE 2**

**SUBSOIL SAMPLING TEST RESULTS**

**STORAGE AREA #3  
EXCESS SPOIL DISPOSAL AREA #2 - PHASE 2**

**SUBSOIL SAMPLING TEST RESULTS**

In preparation for the anticipated reclamation of the Excess Spoil Area #2 Phase 1 area, SCA sampled and tested the subsoil materials within Storage Area #3. Six samples were taken. They were analyzed in three composite samples.

- North 1&2
- Center 1&2
- South 1&2

Analytical results were obtained from the BYU Soil and Plant Analysis Laboratory and are included in this appendix.

All three results showed similar soil conditions. The soil meets the Division requirements for reclamation cover but it is significantly lacking in nutrients.

The soil lab recommended application of fertilizer at a rate of 120 lb N, 60 lb P<sub>2</sub>O<sub>5</sub>, 40 lb K<sub>2</sub>O per acre. While it may need this quantity, SCA proposes to apply less fertilizer with initial seeding and see evaluate the results.

The analytical results also show a high salinity condition. Typical agricultural methods to address high salinity include efforts to over irrigate in an attempt to leach the salts out of the soil. Placement of this soil on the Spoil Disposal Area will facilitate rapid drainage below the soil and will allow for the salts to be removed. It is uncertain whether or not natural precipitation rates will be adequate to address the salinity levels. Although SCA does not generally irrigate its reclamation areas, special attention to the health of the vegetation will be required and may determine that some irrigation is needed.



# BRIGHAM YOUNG UNIVERSITY

## Soil and Plant Analysis Laboratory

255 WIDB  
Provo, UT 84602  
801-422-2147

### Plant and Wildlife Sciences Department

Name Sunnyside Cogeneration  
Street P.O. Box 159  
Sunnyside UT 84539  
City State Zip

### SOIL TEST REPORT AND RECOMMENDATIONS

Date: 18-May-11  
Telephone: 435-888-4476  
Fax: 435-888-2538

Sample Identification	Crop to be grown	pH	% Sand	% Silt	% Clay	Soil Texture	Cation Exchange meq/100g	% Organic Carbon
North 1&2	Turf	7.11	61.28	25.60	13.12	Sandy Loam		0.38

Soil Test	Results	Very Low	Low	Medium	High	Very High	Recommendations
Nitrate-Nitrogen ppm N	0.77	X					apply 120 lbs of N/ac
Phosphorus ppm P	8.85		X				apply 60 lbs of P2O5/ac
Potassium ppm K	54.40		X				apply 40 lbs of K2O/ac
Salinity-EcE dS/m	4.40				X		salinity a problem for sensitive crops
% Moisture Saturation	29.41						
% Very Fine Sand	15.95						
SAR-Sodium Absorption Ratio	0.24	X					no sodium hazard
Calcium-SAR ppm Ca	537.60						
Potassium SAR ppm K	17.12						
Magnesium SAR ppm Mg	634.88						
Sodium SAR ppm Na	35.04						
Boron ppm B	1.08			X			
Selenium ppm Se	0.15						
Ca Carbonate %CaCO3	7.87						
% pyritic Sulfur	0.04						
APB - Tons CaCO3/1000 T.	77.41				X		Good

Notes: ppm = mg/kg

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Date: 18-May-11  
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Sample Identification	Crop to be grown	pH	% Sand	% Silt	% Clay	Soil Texture	Cation Exchange meq/100g	% Organic Carbon
Center 1&2	Turf	7.44	59.28	23.60	17.12	Sandy Loam		0.17

Soil Test	Results	Very Low	Low	Medium	High	Very High	Recommendations
Nitrate-Nitrogen ppm N	1.18	X					apply 120 lbs of N/ac
Phosphorus ppm P	7.96		X				apply 60 lbs of P2O5/ac
Potassium ppm K	54.40		X				apply 40 lbs of K2O/ac
Salinity-ECe dS/m	4.15				X		salinity a problem for sensitive crops
% Moisture Saturation	29.27						
% very Fine Sand	16.32						
SAR-Sodium Absorption Ratio	0.45	X					no sodium hazard
Calcium-SAR ppm Ca	481.28						
Potassium SAR ppm K	11.36						
Magnesium SAR ppm Mg	532.48						
Sodium SAR ppm Na	60.00						
Boron ppm B	1.66			X			
Selenium ppm Se	0.01						
Ca Carbonate %CaCO3	5.42						
% pyritic Sulfur	0.06						
ABP - Tons CaCO3/1000 T.	52.53				X		Good

Notes: ppm = mg/kg

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### SOIL TEST REPORT AND RECOMMENDATIONS

Date: 18-May-11  
Telephone: 435-888-4476  
Fax: 435-888-2538

Sample Identification	Crop to be grown	pH	% Sand	% Silt	% Clay	Soil Texture	Cation Exchange meq/100g	% Organic Carbon
South 1&2	Turf	7.42	59.28	23.60	17.12	Sandy Loam		0.53

Soil Test	Results	Very Low	Low	Medium	High	Very High	Recommendations
Nitrate-Nitrogen ppm N	0.54	X					apply 120 lbs of N/ac
Phosphorus ppm P	8.03		X				apply 60 lbs of P2O5/ac
Potassium ppm K	51.20		X				apply 40 lbs of K2O/ac
Salinity-ECEc dS/m	4.55				X		salinity a problem for sensitive crops
% Moisture Saturation	29.98						
% Very Fine Sand	17.38						
SAR-Sodium Absorption Ratio	0.39	X					no sodium hazard
Calcium-SAR ppm Ca	488.96						
Potassium SAR ppm K	16.80						
Magnesium SAR ppm Mg	640.00						
Sodium SAR ppm Na	56.48						
Boron ppm B	1.22			X			
Selenium ppm Se	0.02						
Ca Carbonate %CaCO3	3.23						
% pyritic Sulfur	0.03						
ABP - Tons CaCO3/1000 T.	31.35				X		Good

Notes: ppm = mg/kg

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- [Plate 9-8E, Excess Spoil Disposal Area #2 Phase 2](#)
- [Plate 9-8F, Excess Spoil Disposal Area #2 Phase 3](#)
- [Plate 9-8G, Excess Spoil Disposal Area #2 Phase 2 & 3 - Earthworks & Cross-Sections](#)

Some concerns exist about handling refuse material that has a net acid-forming potential. The program SCA conducted, for characterization of the refuse pile, identified some material which had a net acid-forming potential. Although the majority of the material analyzed was not acid- nor toxic-forming, SCA will exercise caution in the handling of all coal mine waste material until it is determined that the material is not of concern. The efforts to be taken to determine non-acid and non-toxic potentials are as described above concerning rejected low fuel content material. The precautions to be taken with potentially acid- or toxic-forming material include the following: 1) control surface runoff from the area covered with refuse by diverting through approved sediment ponds and meeting all UPDES discharge requirements for the pond; 2) minimize to the extent possible the quantity of surface flows which run onto or through refuse areas; 3) minimize the potential for spreading of refuse material to undisturbed areas by careful excavating and hauling; 4) other efforts to exercise care through efficient operational methods will also be taken.

#### **9.6.5 Final Disposal of Waste Material (Excess Spoil and Coal Mine Waste)**

The plan presented in Appendix 9-5 describes the design, construction, operation, and maintenance of the Excess Spoil Disposal Area #1. A geotechnical investigation of the foundation was conducted by SHB AGRA INC and is included as Appendix 9-2. Associated maps and cross-section drawings of the area as designed are Plates 9-1 A, B, C & D. Appendix 9-7 presents the plan for the Excess Spoil Disposal Area #2. Maps associated with this plan are included as 9-8, A-D.

Excess spoil and coal mine waste will be placed in a designated Excess Spoil Disposal Area in a controlled manner to:

- (1) Minimize adverse effects of leachate and surface-water runoff from the fill on surface- and ground-water quality and quantity;
- (2) Ensure mass stability and prevent mass movement during and after construction;
- (3) Ensure that the final disposal facility is suitable for reclamation and revegetation compatible with the natural surroundings and the approved post-mining land use;
- (4) Not create a public hazard; and
- (5) Prevent combustion.

At no time will any non-coal mine waste (including, but not limited to, grease, lubricants, paints, flammable liquids, garbage, abandoned mining machinery, lumber, and other combustible materials generated during mining activities) be deposited in the excess spoil fill. No burning waste will be placed in the fill.

The disposal areas are designed in accordance with the requirements for excess spoil fills as well as for refuse piles. Coal mines waste which is disposed of in the excess spoil fill will be placed in accordance with the requirements specified in Appendices 9-2, 9-5 and 9-7 and will be of the proper characteristics to be consistent with the design stability of the fill. Coal mine waste materials from activities located outside the SCA permit area may be disposed of in the permit area only if of the proper characteristics to be consistent with the design stability of the fill.

Information used to design the Excess Spoil Fill was obtained from the John T. Boyd Report presented in Appendix 9-1, the Foundation Investigation Report for Excess Spoil Disposal Area #1 by SHB AGRA Inc. presented in Appendix 9-2, information available from Sunnyside Coal Company, and field surveys conducted by SCA.

The SHB AGRA foundation investigation report, found in Appendix 9-2, is summarized below.

## STABILITY

- The fill should be set back 25 feet from the crest of the natural foundation slope.
  - The outer slopes of the fill should be no steeper than 2.5H:1V.
  - Measures should be taken to prevent surface water discharge on the side slopes of the fill and foundation.
  - Waste material from outside sources with uncertain geotechnical engineering properties, should be placed 10 feet from the outer slopes so that they will not influence potential sliding surfaces in the spoil pile.
- A mass stability factor of safety greater than 1.5 will exist.

### Groundwater Conditions

- No signs of groundwater were observed within the foundation soils in the 15 test pits or at the contact with the Mancos Shale.
- No evidence of ground water flow, seeps, springs, or damp soil on the natural slopes comprising the foundation of the spoil pile.
- Surface water from areas above the fill should be diverted around the fill.
- Percolation tests indicate permeability of approximately  $2.5 \times 10^{-3}$  cm/sec for in-place conditions and about  $8.4 \times 10^{-2}$  cm/sec for loose conditions.
- The material should be free draining and thus pore water pressures should not develop.
- Any low permeability or wet waste material should be scattered throughout the fill.

## PROTECTION OF SURFACE AND GROUND WATER

Runoff from areas above the Excess Spoil Disposal Areas will be diverted around the disposal areas in stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour precipitation event. Runoff from the surface of the Excess Spoil Disposal Areas will be diverted into stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour precipitation event. Hydrologic calculations can be found in Appendix 7-3. Upon reclamation of the Disposal Areas, surface roughening and establishment of vegetation is expected to reduce the potential for storm water runoff adequate to eliminate diversions on the surface of the Disposal Area.

The potential for acidic leachate is minimal because of the sites selected for these permanent disposal areas. The disposal areas do not contain springs, natural or manmade watercourses, or wet weather seeps (see Appendix 9-2, Section 6.3). Under-drains will not be necessary to insure the stability of the fill. Wet waste, such as slurry, will not be disposed in the excess spoil areas. If, for any reason, water seeps out from the base of the fill, it will be contained in the perimeter ditches and diverted with the surface runoff to the existing sediment ponds.

Excess spoil that is acid- or toxic-forming or combustible and all coal mine waste placed in the disposal area will be adequately covered with four-feet of non-acid, non-toxic and non-combustible material, or otherwise treated, to control the impact on surface and groundwater, to prevent sustained combustion, and to minimize adverse effects on plant growth and the approved post-mining land use. Excess spoil that is not acid-forming nor toxic-forming nor combustible may be used to provide some, or all, of this adequate cover.

Analysis to determine the acid- and/or toxic-forming and alkalinity producing potential of the waste material disposed in the Excess Spoil Disposal Area will be performed for the constituents outlined in the Division's "Guidelines for Management of Topsoil and Overburden." The objective of this sampling program is to identify areas within the fill that may adversely impact the surface water, groundwater, plant growth, or the post-mining land use. One grab sample per acre will be taken from each four-foot lift immediately following the completion of the lift and throughout construction of the pile. Results of the sampling shall be submitted to the Division with the Quarterly Engineering Inspection Reports.

## QUANTITIES

Over the life of the SCA facility, the spoil material and coal mine waste which may potentially be disposed in the Excess Spoil Disposal Areas will come from various sources. Each of these sources is discussed in detail in Appendix 9-5.

### Coal Mine Waste

- Breaker reject from the Bradford breaker located at the Sunnyside Mine
- Material from outside sources
- Low fuel potential high ash fuel reject from the crushing/screening operations

### Spoil Material

- West Slurry Cell dike material
- Reclamation materials uncovered from the existing coarse refuse pile
- Fire control materials, Burned wastes within the existing refuse pile, Inert materials
- Sediment cleaned out of the sediment ponds

Table One of Appendix 9-5 projects the approximate quantities per year and for the life of the mine, and the approximate time each source of material will require disposal. Table Two of Appendix 9-5 summarizes the estimated quantities of material to be disposed during different periods through out the life of the mine. Modifications to this plan may still be required throughout the life of the mine as more information is gathered from the mining process.

Some spoil material (less than 15,000 yards) was placed in this Excess Spoil Disposal Area #1-area prior to September 1994 in accordance with the previously submitted plan. This material has been inspected and was adequately placed in a stable condition to meet the design criteria of this plan and the permanent program performance standards.

## SUMMARY

- Foundation slope no steeper than 2.8H:1V (36%)
- Minimum 25 ft. setback from the crest of natural foundation slopes steeper than 2.8H:1V
- Place material in horizontal lifts no deeper than four feet and compact concurrently
- Sample and analyze for acid- or toxic-forming potential, one sample per acre per lift
- Outer slopes of fill no steeper than 2.5H:1V
- Construct terraces on the outer slope every 25-35 feet elevation, 14 ft. wide, 0.8 ft deep, profile slope 1%-4%
- Maximum height of 70 feet

- Minimum surface slope of 2%
- Protect against surface run-on with diversions designed for 100 yr, 6 hr precipitation event
- Coal mine waste, acid-forming, toxic-forming, or combustible material will be covered with a minimum of four feet of non-acid-forming, non-toxic-forming, and non-combustible material
- Regular inspections as required in R645-301-514.

## EXCESS SPOIL DISPOSAL AREA #2

The northeast portion of the Permit Area ~~is currently~~ was formerly occupied by the Slurry Ponds #1 and #2 and the Clear Water Pond. This area has been approved as a permanent disposal area for excess spoil and coal mine waste. Phase 1 of this Disposal Area ~~It has been designed with~~ a capacity of approximately 217,000 cubic yards (See Appendix 9-7 and drawings 9-8 A-D). This phase is nearly complete.

Phase 2 of the Excess Spoil Disposal Area #2 is located essentially on the site of Storage Area #3 (capacity 350,000 cubic yards plus). Phase 3 is located on area currently occupied by portions of the Coarse Refuse Pile and Borrow Area and on the former East Slurry Cell (capacity 710,000 cubic yards plus).

This area is ideal for its proposed use because it is already a large incised hole / excavation in the existing disturbed area. Filling these holes will be the best attempt to return the area to the approximate original contours. This site is designed with a very mild outslope for positive drainage and is located in an area without high groundwater or major surface runoff flows.

Reclamation of this site is bonded for the costs of four feet of cover. At the completion of construction of this disposal area, SCA will perform reclamation with less than four feet in an attempt to demonstrate that successful reclamation can be accomplished with a lesser amount of borrow material cover. In the event that reclamation is not successful, the additional cover will be placed to bring it up to a total of four feet and then reseed the site.

## CAPACITY of the EXCESS SPOIL DISPOSAL AREAS

The design of the Excess-Spoil Disposal Area #1 has a capacity of approximately 467,800 cubic yards (as of 2011, approximately 250,000 cubic yards of capacity was remaining) ~~most of which is still available~~. It should be noted that the area might be compatible to allow for further expansion of the excess spoil disposal area to the east at a later date to handle additional material if necessary.

The Excess Spoil Disposal Area #2 (with the Phase 2 and 3 expansions) has a capacity of approximately ~~217,000~~ 1.3 Million cubic yards. As of 2011, approximately 1.1 Million cubic yards was remaining. ~~As of the 2002 Permit Renewal, the estimated capacity remaining was approximately 150,000 cubic yards.~~ Although this site is available for disposal for all qualified materials, it is anticipated that it will principally be used for disposal of low fuel rejects. These two Excess Spoil Disposal Areas have ample capacity to accept the material quantities projected during the Permit Term ~~(100,000 yards rejects, 30,000 yards spoil materials).~~

The sites described below in "Additional Locations Considered for Excess Spoil Disposal Areas" are available to provide additional capacity for disposal of excess spoil materials in the event that excavation of the existing refuse pile encounters quantities of material beyond what is initially expected. These other

areas may also provide SCA with the opportunity to selectively place different types of spoil material into different locations to the extent possible within the capacities available at the time the materials are disposed.

## RECLAMATION OF EXCESS SPOIL DISPOSAL AREAS

Reclamation of the Excess Spoil Disposal Areas will be in accordance with applicable DOGM regulations. The excess spoil and coal mine waste obtained over the life of SCA operations will be placed in a controlled manner to ensure that the final disposal facility will be suitable for reclamation and revegetation compatible with the natural surroundings and the approved post-mining land use. The area will be reclaimed as outlined in Chapters Nine and Ten.

## ADDITIONAL LOCATIONS CONSIDERED FOR EXCESS SPOIL DISPOSAL AREAS

SCA anticipates designation of ~~three~~ additional sites for the disposal of excess spoil. The sites under consideration include the following: North end of the former East Slurry Cell / Coarse Refuse Pile; and Temporary Storage Area #3; Industrial Borrow Area #1; and the Industrial Borrow Area #3 and Reclamation Borrow Area. SCA will submit a permit amendment for approval by DOGM in the event that it appears necessary to utilize additional sites because of the need for additional disposal capacity. SCA does not intend to be actively constructing various excess spoil areas concurrently without specific justification (such as separation of different types of excess spoil materials, etc.).

Construction design of the additional disposal areas will be submitted following the regulations as required. Construction is expected to be similar to the methods described above and in appendices 9-2 and 9-5 and 9-7. However, the locations of these additional areas are such that specific design issues to meet the requirements for structural stability, drainage concerns, approximate original contours, etc will need to be addressed in the permit amendment.

The additional sites are being considered because of the potential to use excess spoil materials to fill areas from which soil materials were or will be removed for other purposes. Filling with excess spoil could attempt to return the areas to the approximate original contours. These areas are not anticipated to be constructed with steep out-slopes or in major drainage-ways where erosion would be a serious concern. These areas may be used for excess spoil disposal following completion of their current or anticipated use.

### NORTH END OF THE FORMER EAST SLURRY CELL / COARSE REFUSE PILE

The furthest north portion of this area is already designated as Phase 3 of Excess Spoil Disposal Area #2. In the event that more disposal capacity is needed, it would be natural to extend this Disposal Area a bit further into the current Coarse Refuse Pile. Timing would likely occur after removal of refuse material in the area.

### TEMPORARY STORAGE AREA #3

This temporary storage area is located in the northeast portion of the permit area adjacent to the existing Excess Spoil Disposal Area #2. This existing disturbed site could provide for an expansion of Disposal Area #2 and provide additional capacity of approximately 150,000 to 250,000 cubic yards. This site could be constructed without waiting for extensive reclamation work to occur. SCA would need to determine that its ongoing refuse handling operations could function without this temporary storage area or otherwise designate an alternate storage site.

## INDUSTRIAL BORROW AREA #1

The Industrial Borrow Area #1 is located on the north edge of the permit just west of the Pasture Sediment Pond. Some borrow material was removed from this area prior to SCA's purchase of the site. Additional borrow material is available for use in contemporaneous reclamation. If this area is to be used for disposal of excess spoil materials, it could be constructed concurrently with contemporaneous reclamation which removes borrow material from the area. This spoil material could be placed in a manner which helps the area return to the approximate original contours. This area could be expanded to have the capacity to dispose of up to approximately 100,000 to 200,000 cubic yards of spoil material if needed.

## ~~INDUSTRIAL BORROW AREA #3 AND RECLAMATION BORROW AREA~~

~~These borrow areas are located on the east edge of the permit area. Some borrow material has been removed from the Industrial Borrow Area #3. Phased reclamation work throughout the life of the mine, as identified in the reclamation plan, will periodically require additional borrow material to be used until the Industrial Borrow Area #3 has consumed the entire Reclamation Borrow Area at the completion of final reclamation of the permitted area.~~

~~If this area is to be used for disposal of excess spoil materials, it could be constructed concurrently with contemporaneous reclamation which removes borrow material from the area. This spoil material could be placed in a manner which helps the area return to the approximate original contours. This area could be expanded to have the capacity to dispose of up to approximately 400,000 to 500,000 cubic yards of spoil material if needed.~~

## 9.7 BACKFILLING AND GRADING

This section discusses the backfilling and regrading that will be done during the operations plan period. Backfilling and regrading will involve redistribution of spoil material and regrading exposed surface areas that will be reclaimed. The objective of these activities is to restore the site to topographic configurations and geomorphic conditions similar to pre-mining conditions. Final grading of all areas will include blending materials into the surrounding areas and reclaiming as detailed in Plate 10-1.

As discussed under section 9.6.3, the Industrial Waste Dump was closed prior to grading the site for temporary storage of coarse and fine refuse. Additional grading was necessary to establish the storage areas. Grading was required for Storage Areas One, Two, and Four whereas Storage Area Three did not require additional grading. Grading requirements for each storage area are specified under section 9.6.3.

## 9.8 TOPSOIL AND BORROW MATERIAL HANDLING

Mining operations began at the Sunnyside Mines prior to implementation of topsoil salvage requirements. Therefore, borrowed soil materials will be required in most locations in order to achieve successful

## APPENDIX 9-7

### EXCESS SPOIL AREA #2 DESIGN

(Phase 1 Site of former Slurry Ponds #1 & #2 and Clear Water Pond)  
(Phase 2 Site of Storage Area #3)  
(Phase 3 – Site of Borrow Area and part of former East Slurry Cell)

August 2011

# EXCESS-SPOIL DISPOSAL AREA #2 DESIGN

## INTRODUCTION

This plan describes the design, construction, operation, and maintenance of the Excess Spoil Disposal Area #2 in three phases. Appropriate maps and cross-section drawings of the area as designed are included in the Mining and Reclamation Plan. The MSHA ID Number associated with this facility is 1211-UT-09-02093-05.

Excess spoil and coal mine waste will be placed in the designated Excess Spoil Disposal Area #2 (see Plates 9-8 A, B, C & D and 9-8 E, F & G) in a controlled manner to:

- (1) Minimize adverse effects of leachate and surface water runoff from the fill on surface and ground-water quality and quantity;
- (2) Ensure mass stability and prevent mass movement during and after construction;
- (3) Ensure that the final disposal facility is suitable for reclamation and revegetation compatible with the natural surroundings and the approved post-mining land use;
- (4) Not create a public hazard; and
- (5) Prevent combustion.

At no time will any non-coal mine waste (including, but not limited to, grease, lubricants, paints, flammable liquids, garbage, abandoned mining machinery, lumber, and other combustible materials generated during mining activities) be deposited in the excess spoil fill. No burning waste will be placed in the fill.

This disposal area is designed in accordance with the requirements for excess spoil areas as well as for refuse piles. Coal mine waste, which is disposed of in the excess spoil area, will be placed in accordance with the requirements herein and will be of the proper characteristics to be consistent with the design stability of the fill. Coal mine waste materials from activities located outside this SCA permit area may be disposed of in the permit area only if of the proper characteristics to be consistent with the design stability of the fill as stated in this Appendix.

## SITE SELECTION

The ~~attached exhibit~~ drawings identified for the Excess Spoil Pile #2 phases identify the location of the pile with reference to the SCA Power Plant and other features at a scale equal to or better than overlaid on a segment of the USGS 7½ minute Sunnyside Topographic Quad. This disposal area is located on relatively flat ground in the north east portion of the permit site in an area previously occupied by Slurry ponds #1 and #2 and the Clear Water Pond. The Phase 2 expansion is located on and around the existing disturbed Storage Area #3. The Phase 3 expansion is located associated with the former East Slurry Cell, the Refuse Pile and Borrow Area. These sites were selected because it was already a series of large excavated areas ~~in~~ in the existing or

proposed disturbed area. Filling these areasholes will attempt to return the sitearea to the approximate original contours or similar to such. This site is designed with a mild out slope (no steeper than 4H:1V) for positive drainage and is located in an area without high groundwater or major surface runoff flows.

Additional benefits of this site also include the fact that it is a significant distance away from other major surface installations and no mine openings exist within a 500-foot radius of the pile's outer boundary perimeter [30 CFR 77.215-2 (b) (4)]. The SCA power plant is located more than 1000 feet to the west of the pile, and the SCA crushing facilities are located more than 700 feet west of the pile. (See plate 5-1 and 5-1E). It is expected that construction of the disposal area will not affect any previously undisturbed land in the area (with the exception of some portions of the borrow area that will be disturbed for early phases of contemporary reclamation prior to construction of the disposal area).

Federal regulations, 30 CFR 77.214 (b), also require isolation of the pile from any coal seams in the area. No coal seams exist within the near proximity of the spoil pile.

#### STABILITY

The fill and appurtenant structures were designed using current, prudent engineering practices and meet the design criteria established by the Division. Qualified registered professional engineers experienced in the design of earth and rock fills have certified the design of the fill and appurtenant structures. Regulations require that the pile not have an outer slope steeper than 2 horizontal to 1 vertical [30 CFR 77.215 (h)]. Geotechnical studies included in Appendix 9-2 indicate that the typical reject material being placed in this disposal area will have a stable slope at 2.5H:1V. Since the fill is designed with an out slopes of approximately 6H:1V to 4H:1V ±5-20% it has no trouble attaining a minimum long-term static safety factor of 1.5. The foundation and abutments of the fill are in the hole are placed against the excavated embankments left from the excavations. Theyand will be stable under all conditions of construction.

#### FOUNDATION INVESTIGATIONS

Due to the simplicity of this design (filling an existing holeexcavations) foundation investigations were limited. No underground mine workings exist within the SCA permit area to have any effect upon the stability of the fill and appurtenant structures. The slope of the native foundation material in the disposal area does not exceed a slope of 2.8h:1v (36 percent).

#### Groundwater Conditions

- \* No signs of groundwater have been observed within the existing ponds or excavated areas.
- \* Surface water from areas above the fill is designed to be diverted around the fill.

- \* The material to be disposed should be free draining and thus pore water pressures should not develop.
- \* Any low permeability or wet waste material should be scattered throughout the fill.

## TOPSOIL PRESERVATION

No topsoil was segregated from ~~this the Slurry Pond area~~ Coarse Refuse Pile, or Slurry Cells at the time of ~~their~~ construction in the 1970's. No additional topsoil will be segregated from areas within the Excess Spoil Disposal Area. Topsoil / Subsoil material that is removed from under the Disposal Area is intended to be used directly for contemporaneous reclamation in the permit area. An eExisting topsoil piles was created for the Clear Water Pond and Slurry Ponds will be used in reclamation of this site. Since this area has been used as a coarse refuse and slurry handling and storage disposal site for the past couple of decades, subsoils removed for reclamation will be tested prior to use and may require amendments. it would not be appropriate to segregate additional topsoil from this area for future use. All vegetative and organic materials will be removed from the disposal area prior to placement of excess spoil or coal mine waste. SCA will move or use for reclamation all topsoil piles located within the disposal area prior to placement of material at that location.

## CONSTRUCTION

In accordance with 30 CFR 77.215-2 (b) (8), a description of the manner of construction to be employed at the site is as follows:

Excess spoil and coal mine waste will be transported and placed in a controlled manner in horizontal lifts not exceeding 2 feet in thickness; concurrently compacted as necessary to ensure mass stability and to prevent mass movement during and after construction; graded so that surface and subsurface drainage is compatible with the natural surroundings; and covered with topsoil or substitute material. Material will be placed in the fill by end or belly dumping and then spread into compactable lifts.

The gradual progression of the ~~fill will essentially disposal area filled~~ the two slurry ponds to their proposed surface, then ~~filling~~ the Clearwater Pond and ~~connecting~~ to the initial phases of the pile constructed over the slurry pond area. Progression into the south phases will essentially connect from the existing pile to the east embankment and move to the south as material is generated for disposal.

Compaction of the spoil materials and coal mine waste materials will be accomplished by wheel rolling from the hauling and spreading equipment such as ten wheel dump trucks, other haul trucks, belly dumps, scrapers, dozers, etc. Spreading and compacting the material in intermediate lifts less than two feet can add to the effectiveness of compaction by wheel rolling.

The final configuration of the fill will be suitable for the approved post-mining land use. The grade of the out-slope will be approximately ~~15-20 percent~~ 6H:1V to 4H:1V.

Detailed drawings (including typical sectional maps of the pile crosswise and lengthwise) as required by 30 CFR 77.215-2 (b) (8), are provided as Plates 9-8 A, B, C, D and 9-8 E, F & G. These show all dimensions of the spoil pile to be constructed.

No permanent impoundments will be constructed on the completed fill. The final surface will be left in a roughened condition such that the small depressions should minimize erosion and assist revegetation.

#### BURNING AND BURNED WASTE UTILIZATION

All possible efforts will be made to reduce the potential for the occurrence of coal mine waste fires in the Excess Spoil Disposal Area #2. Although coal mine waste will be placed in the fill, it is intended that this material will have a very low BTU level and therefore not create a significant risk of combustion. Ash materials from burned coal mine waste may be placed in the fill but should not create a significant risk of combustion. No burning waste will be placed in the fill.

In the event that a coal mine waste fire occurs, it will be extinguished by the proper personal who conduct the surface mining activities, in accordance with the plan approved by the Division and the Mine Safety and Health Administration as required by 30 CFR 77.215(j). This plan essentially entails the placement of two feet (or more if necessary) of non-combustible soil material over the burning area. Only those persons authorized by the operator, and who have an understanding of the procedures to be used, will be involved in the extinguishing operations. No burning or unburned coal mine waste will be removed from a permitted disposal area without a removal plan approved by the Division. Consideration will be given to potential hazards to persons working or living in the vicinity of the structure.

#### ACID- and/or TOXIC-FORMING POTENTIAL OF WASTE

Previous tests of the material at the SCA facilities have indicated that the acid- and/or toxic-forming potential of the waste is not a significant problem. However, in order to be conservative, analysis to determine the acid- and/or toxic-forming and alkalinity producing potential of the waste material disposed in the Excess Spoil Disposal Area will be performed for the constituents listed below. The objective of this sampling program is to identify areas within the fill that may adversely impact the surface water, groundwater, plant growth, or the post-mining land use. One grab sample per acre will be taken from each four-foot lift immediately following the completion of the lift and throughout construction of the pile. Samples of like material may be composited to facilitate cost effective testing. Results of the sampling shall be submitted to the Division with the Quarterly Engineering Inspection Reports.

Excess spoil that is acid- or toxic-forming or combustible materials placed in the disposal area will be adequately covered with four-feet of non-acid, non-toxic and non-combustible material, or otherwise treated, to control the impact on surface and groundwater, to prevent sustained combustion, and to minimize adverse effects on plant

growth and the approved post-mining land use. Excess spoil that is not acid- or toxic-forming or combustible may be used to provide some, or all, of this adequate cover.

Coal mine waste materials, of which geologic properties are uncertain or which have sub-standard geologic characteristics, will be scattered within the interior of the pile at least ten feet from the outer slopes. Waste materials from areas outside of the SCA permit site, but which are comparable to the materials considered in the design of the fill, may be placed in the fill by SCA in accordance with the standards of this section but without additional restriction.

#### ANALYSIS PARAMETERS

- \* pH
- \* Particle Size Analysis (% sand, silt, clay)
- \* Soluble Ca, Mg, and Na
- \* Selenium
- \* Nitrate-N
- \* Maximum Acid Potential
- \* Organic Carbon
- \* Electrical Conductivity
- \* Sodium Adsorption Ration
- \* Total N
- \* Boron
- \* Neutralization Potential
- \* Sulfur-total

#### PROTECTION OF SURFACE AND GROUND WATER

Runoff from areas above the Excess Spoil Disposal Area #2 will be diverted around the disposal area in stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour precipitation event. Runoff from the surface of the Excess Spoil Disposal Area will be diverted into stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour precipitation event. Upon reclamation of the pile, surface roughening and establishment of vegetation is expected to reduce the potential for storm water runoff adequate to eliminate diversions on the surface of the Disposal Area.

The potential for acidic leachate is minimal because of the site selected for this permanent disposal area. The disposal area does not contain springs, natural or manmade watercourses, or wet weather seeps. Under-drains will not be necessary to insure the stability of the fill.

Wet waste, such as slurry, will not be disposed in the excess spoil area. If, for any reason, water seeps out from the base of the fill, it will be contained in the perimeter ditches and diverted with the surface runoff to the existing sediment ponds.

## HYDROLOGIC FLOWS

Diversions have been constructed and will be maintained around the perimeter of the fill. Hydrologic calculations have been prepared for the surrounding area, which is fairly representative of the proposed ground surface during construction and will improve upon completion of the revegetation.

During construction of the fill, the existing diversions will be adequate to control runoff and direct the adjacent surface flows around the fill. These existing diversions include ~~the old slurry ditch, which is no longer used for slurry transport, the Phase 1 east perimeter ditch~~ (at least 1 foot~~2~~ feet deep and 48 feet wide). Upon connection of Phase 2 into Phase 1, a permanent 18" RCP culvert will be installed in this Phase 1 East perimeter ditch going southwesterly under the Phase 2 pile. An existing and the surface diversion will direct other runoff around the north and west side of Phase 1 into the Clear Water Pond (approximately 1 foot deep and 4 feet wide). Additional perimeter diversion ditches (at least 1 ft deep and 4 ft wide) will be constructed along the south, east and west sides of the Phase 2 and 3 areas to prevent water from flowing onto the fill and to collect runoff from the fill. [30 CFR 77.215-2 (b) (6)] (See Appendix 7-3 for hydrologic calculations).

Construction of the fill will occur in a layering manner such that the direct precipitation falling on the fill can flow off of the fill ~~when the existing slurry ponds are filled. No impounding of water on the fill is expected. As the perimeter of the fill expands to the south, the perimeter ditch will be moved from time to time to control runoff flows and direct them into the designated sediment ponds (Pasture or Borrow Area Ponds). The site will be maintained in such a way that the acres contributing to the Pasture Pond or the Borrow Area Ponds during and after construction of the fill will be similar to the acres contributing now. Following the filling of the slurry ponds and when it is necessary to divert runoff around the Clear Water Pond so that it can be filled with spoils, the final diversions (minimum 1.5 foot cut ditches and culverts where shown) will follow the alignments shown on Plate 9-8C. This shows that the runoff from this area will flow into the diversions, around the fill and either to the Pasture Pond or the upper end of the East Slurry Cell as shown.~~

## EROSION CONTROL

Uncontrolled surface drainage will not be diverted over the out-slope of the disposal area. Outer slopes will be graded at a mild slope in order to minimize surface erosion at the site and provide adequate stability. The final surface configuration will leave a roughened condition to reduce the potential for direct runoff from the fill. This will reduce the amount of rill and gully erosion and therefore increase the long-term stability. Successful revegetation will further assist in erosion control.

All disturbed areas of the fill, will be revegetated upon completion of construction in an effort to demonstrate successful reclamation with less than four feet of borrow material cover over non-acid forming, non-toxic forming coal mine waste. The success of the revegetation will also evaluate its ability to control erosion. However, until it is proven

that less than four feet of borrow material will be adequate for reclamation, SCA will maintain its bond based on utilizing ~~a total of the entire~~ four feet of cover.

The sediment ponds ~~remaining~~ in place, until bond release, will perform final sediment control.

## INSPECTIONS

A qualified registered professional engineer, or other qualified professional specialist under the direction of the professional engineer, will periodically inspect the fill during construction. The professional engineer or specialist will be experienced in the construction of earth and rock fills.

Such inspections will be made at least quarterly throughout construction and during critical construction periods. Critical construction periods will include at a minimum: foundation preparation, including the removal of all organic material and topsoil; installation of final surface drainage systems; and, the final graded and revegetated fill. Regular inspections by the engineer or specialist will also be conducted during placement and compaction of fill materials.

The qualified registered professional engineer will provide a certified report to the Division promptly after each inspection that the fill has been constructed and maintained as designed and in accordance with the regulatory requirements. The report will include appearances of instability, structural weakness, and other hazardous conditions as well as the results of samples taken to determine the acid/toxic potential. The photographs accompanying each certified report will be taken in adequate size and number with enough terrain or other physical features of the site shown to provide a relative scale to the photographs and to specifically and clearly identify the site. A copy of each inspection report will be retained at or near the mine site. A copy of the report will be sent promptly by SCA to DOGM.

If any examination or inspection discloses that a potential hazard exists, the Division will be informed promptly of the findings and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented, the Division will be notified immediately. The Division will then notify the appropriate agencies that other emergency procedures are required to protect the public.

More frequent inspections will be conducted if a danger of harm exists to the public health and safety or the environment. Inspections will continue until the ~~refuse~~ pile Disposal Area has been finally graded and revegetated or until a later time as required by the Division.

## CAPACITY of the EXCESS SPOIL DISPOSAL AREA #2

~~The is disposal area has a design capacity of Phase 1 of this disposal area is~~ approximately 217,000 cubic yards. ~~This capacity is nearly full. (see calculation table on next page).~~ Phase 2 is calculated to have a capacity of approximately 350,000 cubic yards (plus the volume of any subsoils removed prior to placing fill). Phase 3 is calculated to have a capacity of approximately 710,000 cubic yards (plus the volume of any topsoils, subsoils or coal refuse materials removed prior to placing fill). (see quantity calculations on the 9-8 series drawings).

Upon approval, ~~much of the phase 2 area it~~ is readily available for use without additional site preparation. ~~Some portions of the phase 2 and 3 areas will first have reclamation cover excavated and used for contemporaneous reclamation needs in the permit area. Other portions will have coal refuse fuel material excavated for use in the adjacent cogeneration facility. When SCA determines that an adequate quantity of fuel material or reclamation material has been removed from the site, then it will be ready for construction of the fill.~~

Over the life of the SCA facility, the spoil material and coal mine waste which may potentially be disposed in excess spoil disposal areas may come from various sources. These sources are explained in detail in Appendix 9-5. However, it is expected that this site will principally be used for disposal of low fuel potential/high ash rejects from the crushing operation. ~~Under currently planned operations, Given the disposal patterns observed during the past several years,~~ it is anticipated that approximately ~~260,000 to 80,000~~ cubic yards of this reject material may require disposal each year within the next permit term. ~~The Phase 2 area~~ This site alone has adequate capacity to dispose of all anticipated reject material to be generated ~~throughout the current within the next~~ permit term ~~and through the remainder of the current bond period.~~

## FINAL RECLAMATION OF SPOIL DISPOSAL SITE

Final reclamation of Excess Spoil Disposal Area #2 will be in accordance with applicable DOGM regulations. The excess spoil ~~and coal mine waste~~ obtained over the life of SCA operations will be placed in a controlled manner to ensure that the final disposal facility will be suitable for reclamation and revegetation compatible with the natural surroundings and the approved post-mining land use. As previously discussed, it is the intent of SCA to initially utilize this site as a demonstration area to evaluate the success of reclamation with less than four feet of borrow material cover over coal mine waste ~~that is non-acid and non-toxic forming. The intent is to determine if reclamation over such coal mine waste can be successful without disturbing additional large areas to excavate new soil borrow material.~~ Nonetheless, SCA has posted bond adequate to reclaim the area with a total of four feet of cover if necessary. Release of this bond will not be requested until the reclamation is demonstrated successful.

The Phase 1 area reclamation demonstration (approximately 8 acres) will occur within one to two years from approval of the Phase 2 & 3 expansion plans. This demonstration will include use of subsoils excavated from the Storage Area #3 (Excess Spoil Area #2 Phase 2) area. This subsoil has been tested and will require amendments (see test results in Appendix 2-12). The Phase 1 area demonstration will include the following steps

- Place a minimum of 2 feet of subsoil from the Storage Area #3 site
- Incorporate 1.5 ton per acre of certified weed free hay mulch into the soil
- Seed with approved interim seed mix or annual grain (anticipating soil cover will not be completed at an appropriate time of year for final reclamation seed mix)
  - Include 250 lb/acre 16-16-8 fertilizer (slow release) or equivalent
- Evaluate success of interim vegetation growth and soil amendment success
- Depending on the success of the interim vegetation proceed as needed with the following
  - Place approximately 3 to 6 inches of topsoil / clean borrow material
    - If interim vegetation growth and soil amendment success is not adequate, additional soil may be necessary
  - Roughen site to reduce erosion potential (4"-8" deep pockets)
  - Hydroseed final reclamation seed mix including 2 tons per acre wood fiber mulch and fertilizer if deemed necessary after consultation with DOGM.
- As an alternate, SCA may choose to place the described 2 feet of subsoil and 3-6 inches of topsoil/borrow material at the same time, incorporate mulch and fertilizer and seed with final seed mix all at once.

Since all of the cover material being used meets the guidelines for reclamation cover, SCA will adjust the remaining depth of cover (i.e. 4 ft total minus 2.5 ft placed = 1.5 ft remaining) in subsequent bond calculations until such time that full bond release is granted.

**Sunnyside Cogeneration Associates  
Sunnyside Refuse and Slurry C/007/035  
Excess Spoil Disposal Area #2  
Revised Capacity Calculations**

	<u>Cross Sectional Areas</u>		Dist. Between Sections (ft)	<u>Volume Comparison Calculations</u>	
	Total Pile Area (1997 conditions) (sf)	Remaining Pile Area (2002 conditions) (sf)		Total Pile Volume (beginning 1997) (cy)	Remaining Pile Volume (after 2002) (cy)
South	0	0	0		
Section E	849	622	48	755	553
Section F	2,222	1,664	100	5,687	4,233
Section G	3,071	2,047	100	9,802	6,872
Section H	3,914	2,426	100	12,930	8,283
Section I	4,479	2,816	100	15,537	9,707
Section J	5,303	3,734	100	18,115	12,130
Section K	9,954	9,258	100	28,248	24,059
Section L	10,424	7,926	100	37,731	31,822
Section M	7,880	4,710	100	33,896	23,400
Section N	7,555	4,240	100	28,583	16,574
Section O	4,110	1,770	100	21,602	11,130
North	0	0	55	4,186	1,803
				<u>217,072</u>	<u>150,567</u>

Note:—Volume 1997 represents the total volume of the pile based on the bottom surface that existed in 1997 prior to beginning construction and filling the slurry ponds. Volume 2002 represents the remaining volume based on the existing surface in 2002 with the slurry ponds partially filled. Both calculations are projecting a finished top surface as shown on the drawings signed Oct 18, 2004.

Note:—See Drawings 9-8B and 9-8D for cross section maps

**TABLE 8-1**

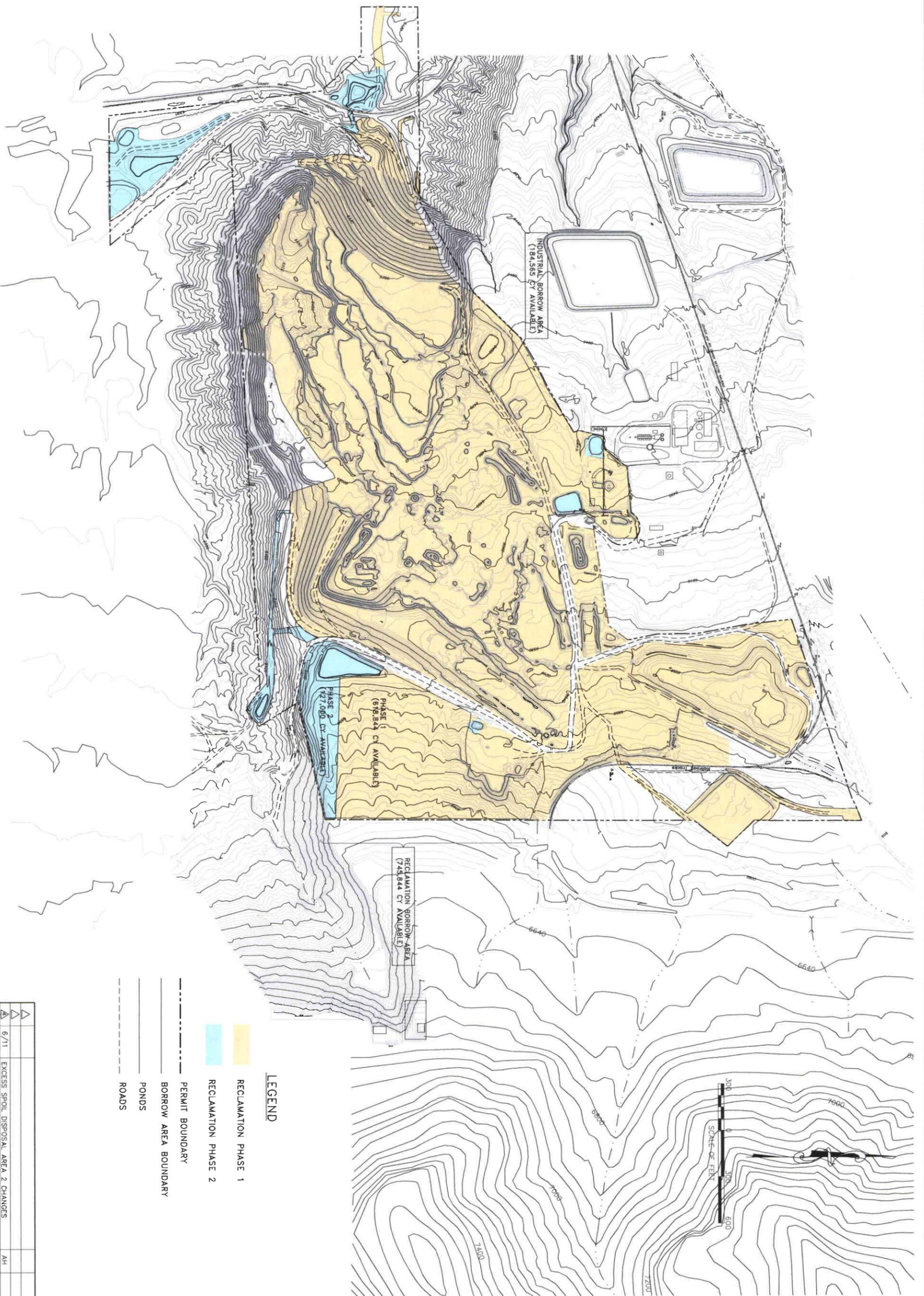
**DETERMINATION OF BOND AMOUNT**

## DETERMINATION OF BOND AMOUNT - Summary

ITEM	QUANTITY	RATE	COST
Total Crusher Demolition Culvert Removal & Riprap			\$ 130,042
Total Backfill, Grading and support			\$ 795,562
Total Revegetation and Erosion Control			\$ 297,714
<b>Total (Direct Costs)</b>			<b>\$ 1,223,319</b>
Mobilization and Demobilization	10%		\$ 122,332
Contingency	5%		\$ 61,166
Engineering Redesign	2.5%		\$ 30,583
Main Office Expense	6.8%		\$ 83,186
Project Management Fee	2.5%		\$ 30,583
<b>Total (Indirect Costs)</b>	<b>26.8%</b>		<b>\$ 327,850</b>
<b>Total (Direct and Indirect Costs - 2010 dollars)</b>			<b>\$ 1,551,169</b>
Escalation 5 years to Mid Term 2015	5	0.50%	\$ 39,169
<b>Total Reclamation Costs (Escalated)</b>			<b>\$ 1,590,338</b>
<b>Bond Amount Required (Rounded to the nearest \$1,000)</b>			<b>\$ 1,590,000</b>

## DETERMINATION OF BOND AMOUNT - Revegetation

ITEM	QUANTITY	UNIT COST	COST
<b>Atriplex Grass Revegetation Areas</b>			
Seed Material Costs (Granite Seed Sept 2010)	75.2 Acres	\$ 359.00	\$ 26,997
Tractor Spreader (equip & labor) B-66 Reveg 004 + 10%	3,276 MSF	\$ 11.55	\$ 37,834
Fertilizer hydrosread M029351000180 + 10%	3,276 MSF	\$ 4.18	\$ 13,692
<b>Pinyon Juniper Sagebrush Revegetation Areas</b>			
Seed Material Costs (Granite Seed Sept 2010)	123.3 Acres	\$ 566.70	\$ 69,874
Tractor Spreader (equip & labor) B-66 Reveg 004 + 10%	5,371 MSF	\$ 11.55	\$ 62,034
Fertilizer hydrosread M029351000180 + 10%	5,371 MSF	\$ 4.18	\$ 22,451
<b>Hydrophytic Revegetation Areas</b>			
Seed Material Costs (Granite Seed Sept 2010)	0.6 Acres	\$ 279.90	\$ 168
Tractor Spreader (equip & labor) B-66 Reveg 004 + 10%	26 MSF	\$ 11.55	\$ 302
Fertilizer hydrosread M029351000180 + 10%	26 MSF	\$ 4.18	\$ 109
<b>Subtotal Revegetation</b>	<b>199.1 Acres</b>		<b>\$ 233,462</b>
<b>Reseeding 25%</b>	<b>49.8 Acres</b>		<b>\$ 58,365</b>
Plastic netting (Means 312513100100)	5,000 square yards	\$ 1.13	\$ 5,650
Silt fences (Means 312513101000)	300 Linear Feet	\$ 0.79	\$ 237
<b>Total Erosion Control</b>			<b>\$ 5,887</b>
<b>Total Revegetation and Erosion Control</b>			<b>\$ 297,714</b>



**LEGEND**

	RECLAMATION PHASE 1
	RECLAMATION PHASE 2
	PERMIT BOUNDARY
	BORROW AREA BOUNDARY
	PONDS
	ROADS

REV	DATE	DESCRIPTION	BY	APP'D.
△	6/11	EXCESS SPOIL DISPOSAL AREA 2 CHANGES	AH	
△	11/10	BOUNDARY AND TOPO UPDATES	AH	
△	9/02	2002 PERMIT RENEWAL	AH	
△	9/97	PERMIT RENEWAL - UPDATES	AH	

8-1

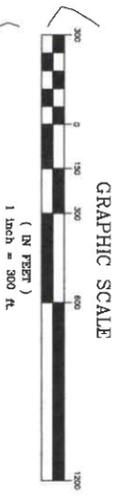
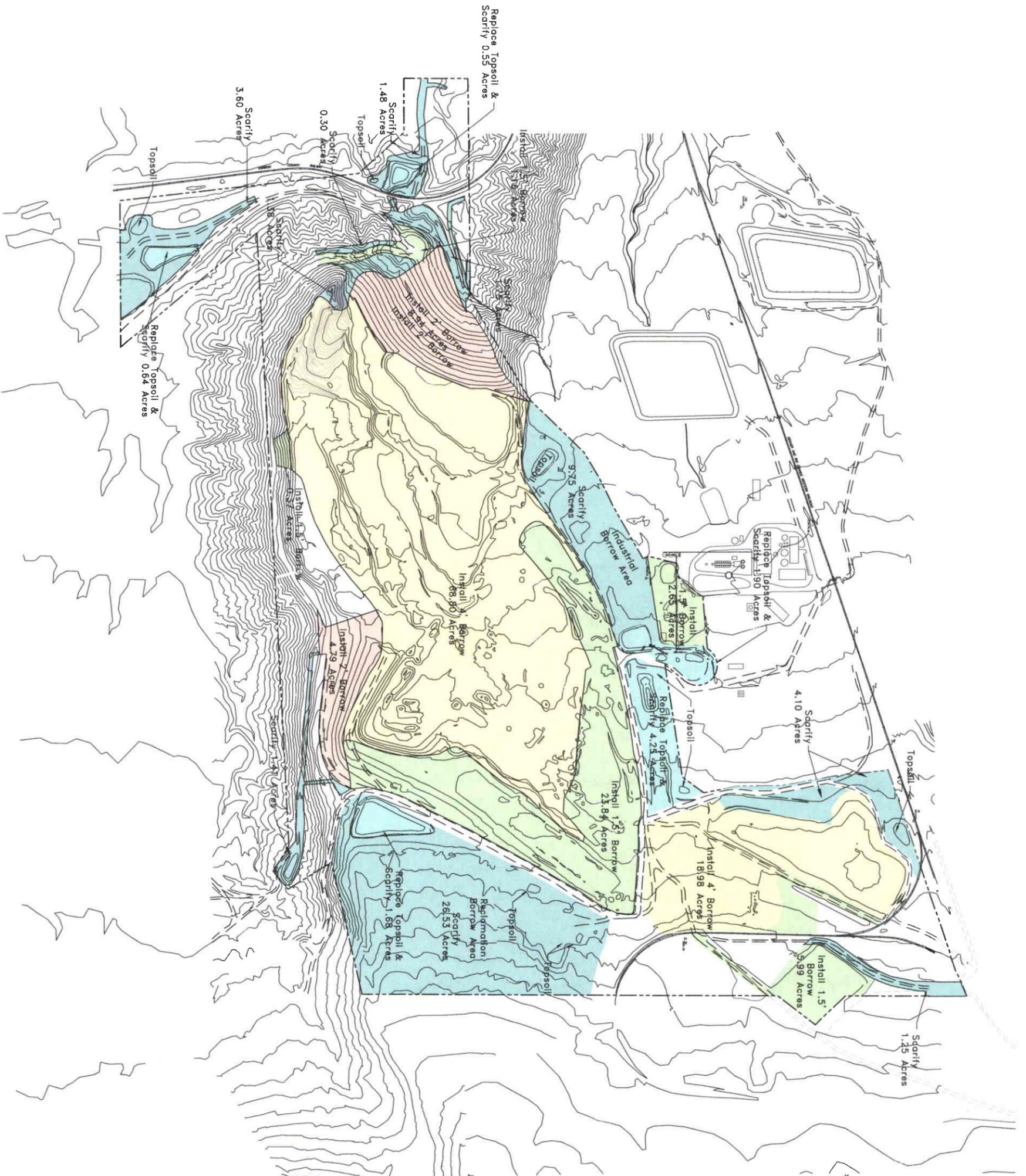
DESIGNED	AH
DRAWN	AH
CHECKED	SSC

**TWIN PEAKS**  
 Engineering & Land Surveying  
 2264 NORTH 1450 EAST LEHI, UTAH 84043  
 (801) 450-3511, (801) 439-0700 FAX

Sunnyside Cogeneration Associates  
 PERMIT TERM RECLAMATION PLAN  
 PHASING PLAN

7-11-94
SCALE
PROJECT NO.





**BORROW MATERIAL QUANTITIES**

4' Borrow Cap X 87.78 Acres =	566,473 CY
2' Borrow Cap X 13.73 Acres =	44,302 CY
1.5' Borrow Cap X 33.64 Acres =	81,409 CY
<b>Total Borrow =</b>	<b>692,184 CY</b>
<b>Scarify Soil Prior To Seeding =</b>	<b>51.6 AC</b>
<b>Regrade, Scarify &amp; Replace Topsoil =</b>	<b>9.0 AC</b>
<b>Topsoil =</b>	<b>7,928 CY</b>

**Notes:**

- At the time of final reclamation four feet of borrow material will be placed over areas that are occupied by unsuitable plant growth medium, as determined by testing. This includes slurry ponds and cells, and the upper refuse pile.
- At the time of final reclamation two feet of borrow material will be placed over areas on the coarse refuse pile which have previously been covered with two feet of borrow material.
- At the time of final reclamation up to eighteen inches of borrow material will be placed over areas which have some refuse on the surface only. These areas will have up to eighteen inches of refuse material, as determined by testing, scraped from the surface before being capped. The depth of material removed or added will be based on testing of the site as reclamation. This scraped material will be used as borrow material, slurry ponds cells before they are capped with borrow material.
- At the time of final reclamation, areas which have no refuse will be scarified to assist revegetation.
- At the time of final reclamation, areas which have had topsoil removed and stockpiled, will have the topsoil redistributed. These areas will be scarified to reduce potential slippage of the redistributed material and to assist revegetation.
- Some areas may be regraded as necessary to meet the post-mining land use prior to placement of topsoil, or scarification of existing soil.
- Minimal grading will be utilized to redistribute the dumped borrow materials sufficient to cover the reclaimed sites. The borrow materials will be spread unevenly to create small depressions which will retain moisture, minimize erosion, create and enhance wildlife habitat, and assist revegetation.

REV	DATE	DESCRIPTION	BY	APP'D
Δ	6/11	EXCESS SPILL DISPOSAL AREA 2 CHANGES	AH	
Δ	11/10	BOUNDARY AND TOPO UPDATES	AH	
Δ	10/02	2002 PERMIT RENEWAL	AH	
Δ	9/97	PERMIT RENEWAL-UPDATES	AH	
Δ	10/95	RECLAMATION AREAS	AH	
Δ	7/94	ADDED COAL PILE AREA	LK	

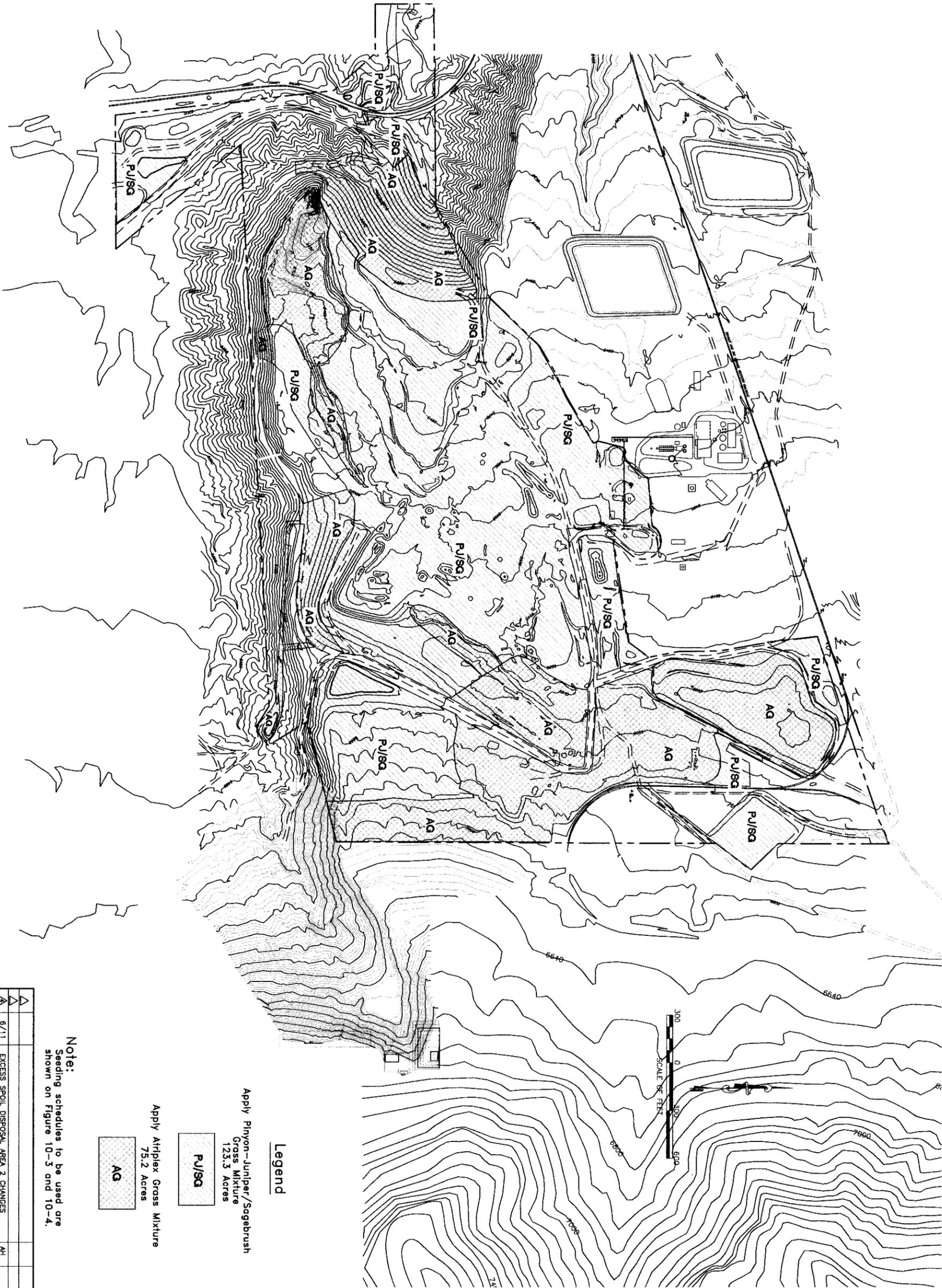
DESIGNED	AH
DRAWN	AH
CHECKED	SSC

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Sunnyside Cogeneration Associates  
 PERMIT TERM RECLAMATION PLAN  
 BORROW MATERIAL PLAN

9-11-94
SCALE
PROJECT NO.





Note:  
Seeding schedules to be used are  
shown on Figure 10-3 and 10-4.

- Legend**
- Apply Pinyon-Juniper/Sagebrush  
Grass Mixture  
123.3 Acres  
**P/SG**
  - Apply Atriplex Grass Mixture  
75.2 Acres  
**AG**

REV	DATE	DESCRIPTION	BY	APP'D.
△				
△	6/11	EXCESS SPOIL DISPOSAL AREA 2 CHANGES	AH	
△	11/10	BOUNDARY AND TOPO UPDATES	AH	
△	9/02	2002 PERMIT RENEWAL	AH	
△	9/97	PERMIT RENEWAL-UPDATES	AH	

DESIGNED	AH
DRAWN	AH
CHECKED	SSC

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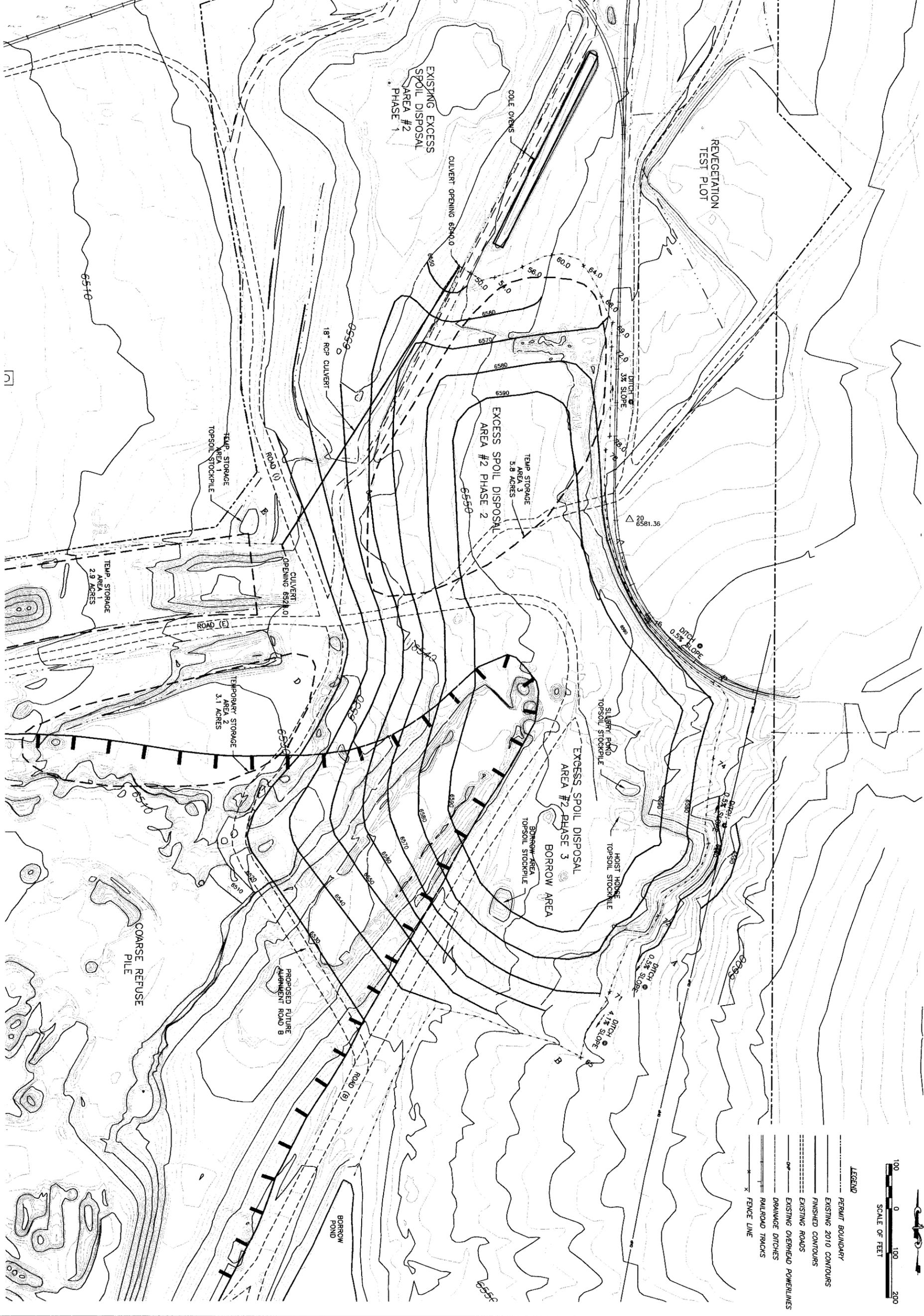
Sunnyside Cogeneration Associates  
**PERMIT TERM RECLAMATION PLAN**  
**SEEDING PLAN**

7-12-94
SCALE
PROJECT NO.



8-5





**LEGEND**

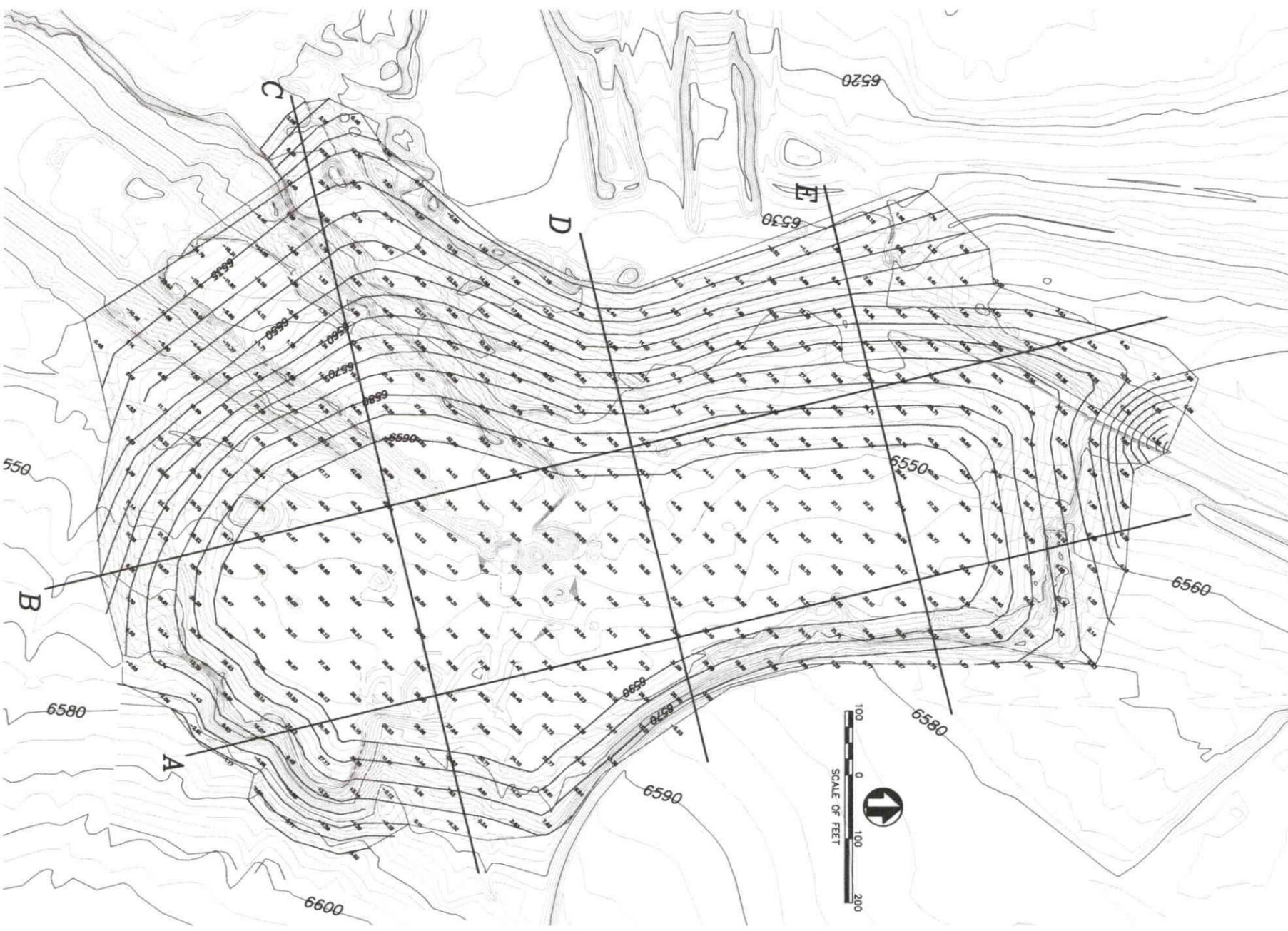
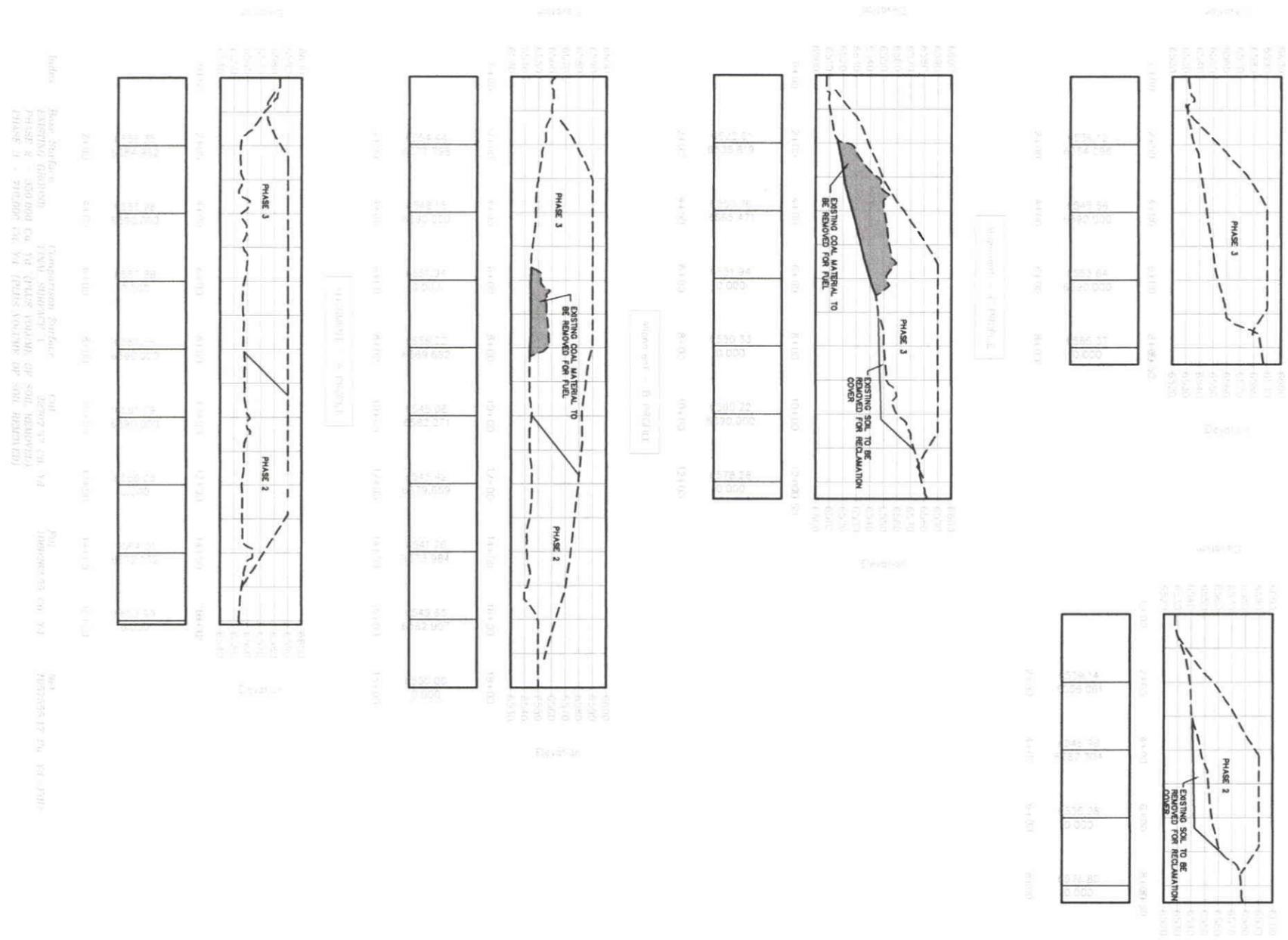
---	PERMIT BOUNDARY
---	EXISTING 2010 CONTOURS
---	FINISHED CONTOURS
---	EXISTING ROADS
---	EXISTING OVERHEAD POWERLINES
---	DRAINAGE DITCHES
---	RAILROAD TRACKS
---	FENCE LINE

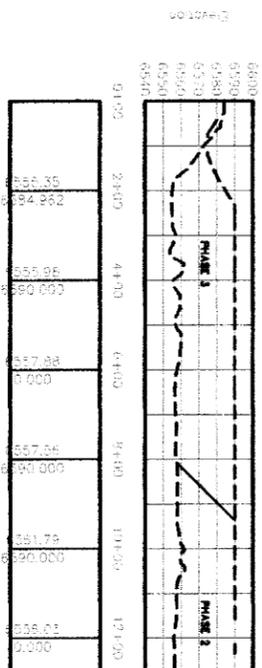
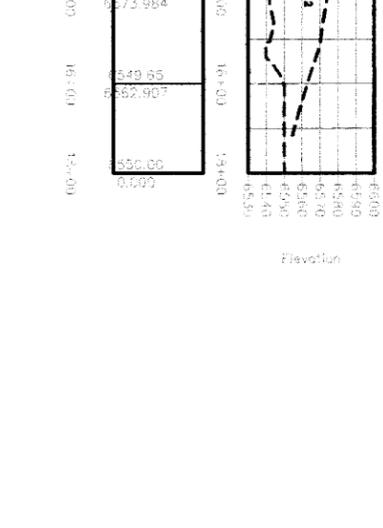
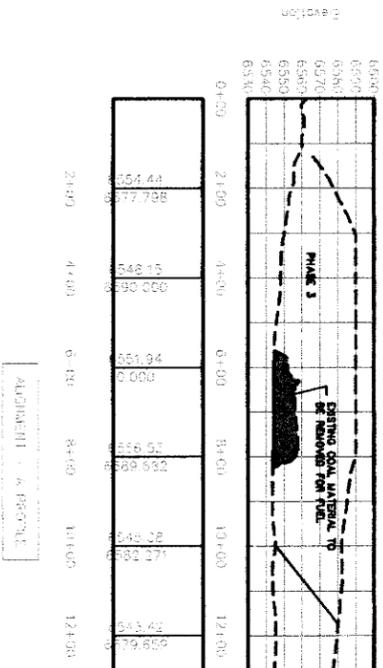
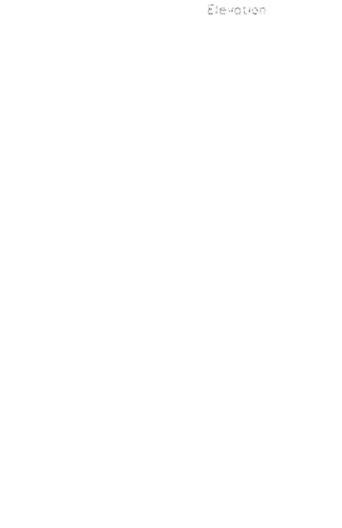
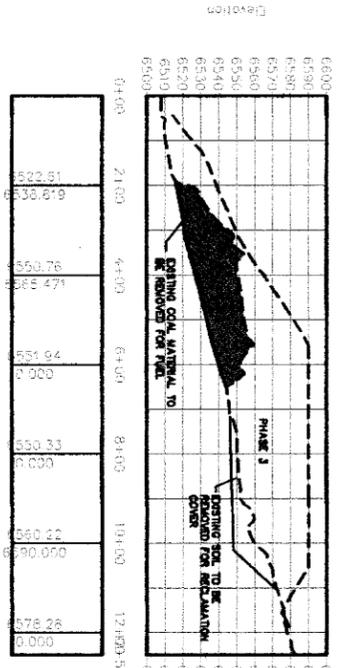
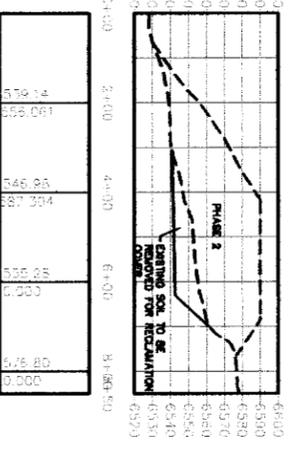
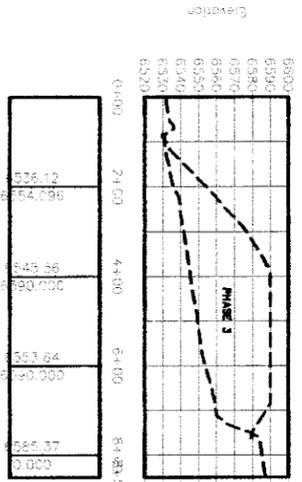
**SUNNYSIDE COGENERATION ASSOCIATES**  
**EXCESS SPOIL DISPOSAL AREA #2**  
**PHASE 3**

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DATE: MAY 2011  
 DATE: 12 AUGUST 2011

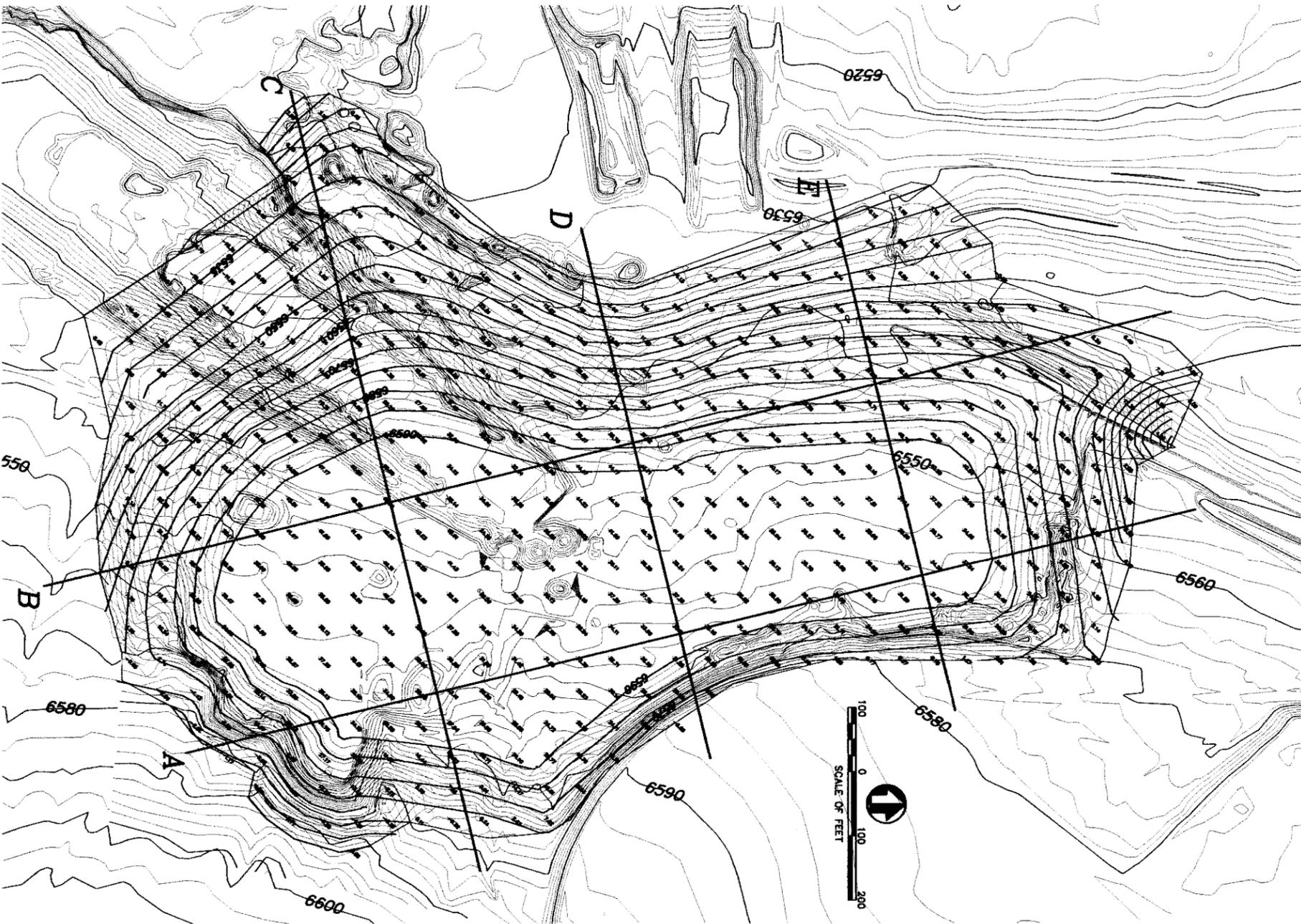
9-8F





Index

Base Surface	Comparison Surface	Yd
EXISTING GROUND	FINAL SURFACE A	22707.27 Cu Yd
PHASE 2	FINAL SURFACE B	10676.55 Cu Yd (PHASE 2)
PHASE 3	FINAL SURFACE C	10676.55 Cu Yd (PHASE 3)

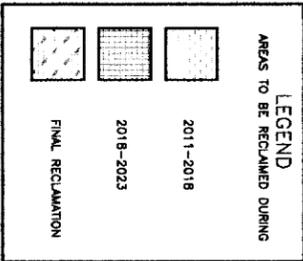
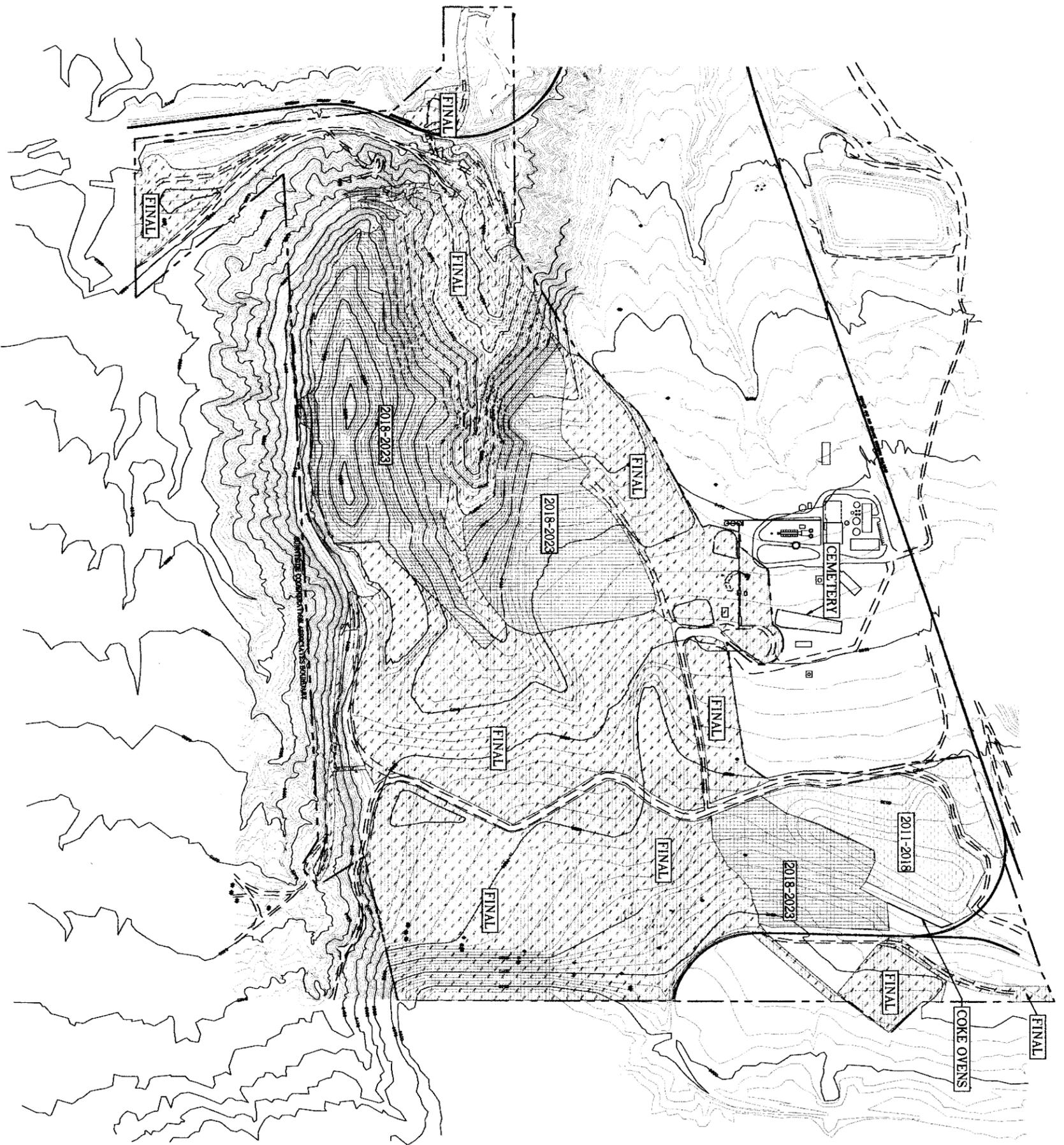


**SUNNYSIDE COGENERATION ASSOCIATES**  
**EXCESS SPOIL DISPOSAL AREA #2**  
**PHASE 2 AND PHASE 3**  
**EARTHWORKS & CROSS SECTIONS**

**TWIN PEAKS**  
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DATE: MAY 2011  
 DRAWN BY: 09 August 2011

9-8G



REV	DATE	DESCRIPTION	BY
1	6/11	EXCESS SPOIL DISPOSAL AREA 2 CHANGES	AH
2	11/10	BOUNDARY UPDATES	AH
3	9/02	2002 PERMIT RENEWAL	AH
4	10/95	CORRECTED PLOT (A&B)	ND
5	8/95	RECLAMATION WORK PERFORMED	AH

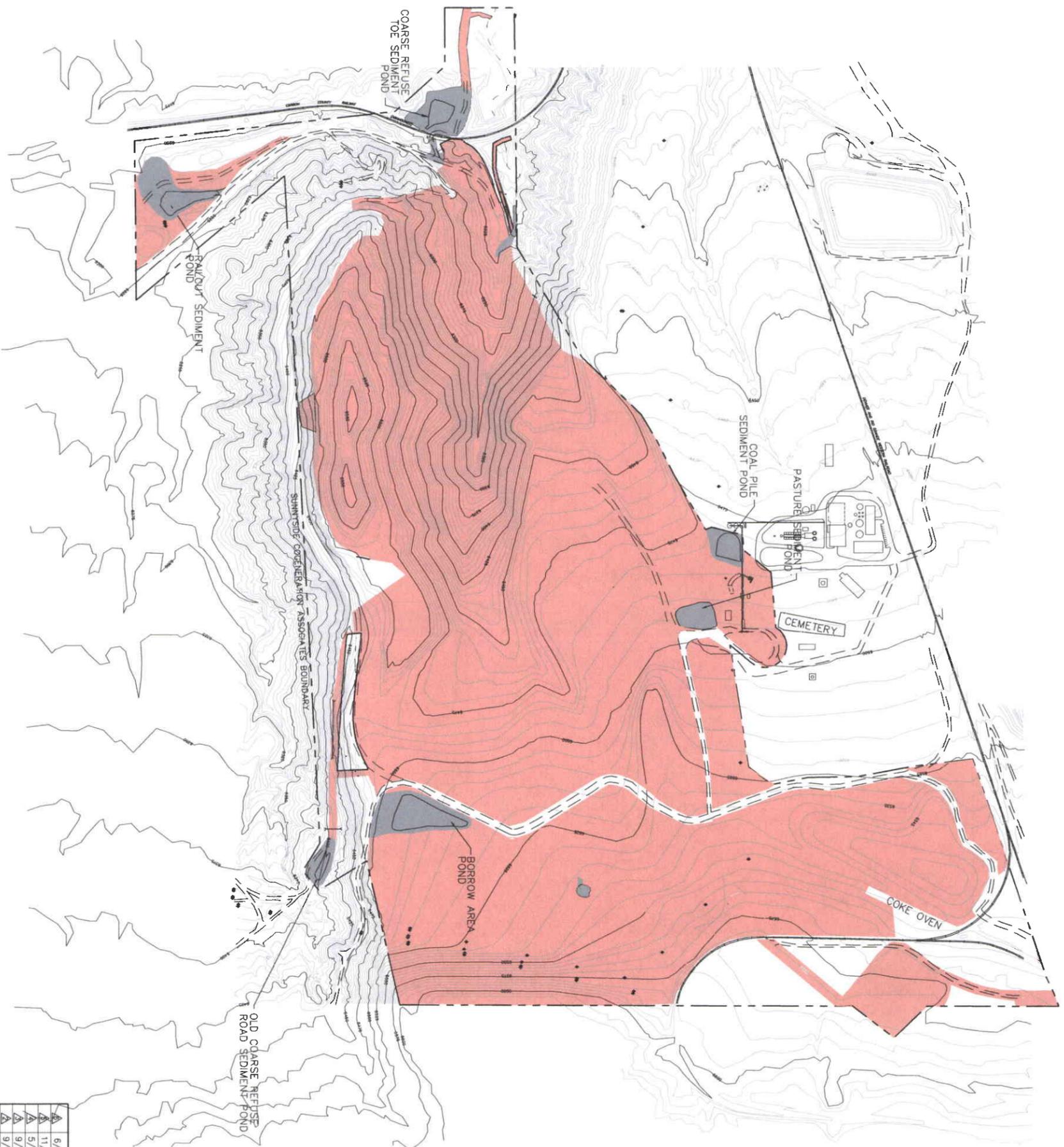
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DRAWN	AH
CHECKED	AEB

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Sunnyside Cogeneration Associates  
**FINAL RECLAMATION PLAN**  
 PHASING PLAN

8/94
SCALE
PROJECT NO.





**LEGEND**

- PERMIT BOUNDARY
- ROADS
- ◆ POWER POLES

- PHASE 1 RECLAMATION
- PHASE 2 RECLAMATION

REV	DATE	DESCRIPTION	BY	APP'D
△	6/11	EXCESS SPOIL DISPOSAL AREA 2 CHANGES	AH	
△	11/10	BOUNDARY UPDATE	AH	
△	5/07	PASTURE POND UPDATE	AH	
△	9/05	CLEARWATER POND RECLASSIFICATION	AH	
△	9/02	2002 PERMIT RENEWAL	AH	
△	8/95	RECLAMATION OF OLD COARSE REFUSE ROAD	ND	

DESIGNED	AEB
DRAWN	AH
CHECKED	AEB

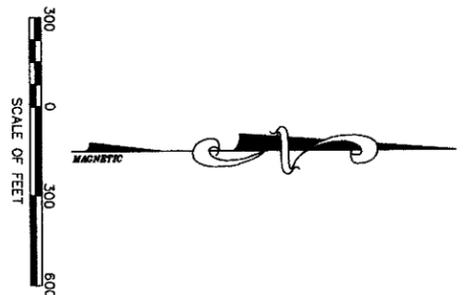
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Sunnyside Cogeneration Associates  
**FINAL RECLAMATION**  
**GRADING PLAN**

DATE	01-10-95
SCALE	
PROJECT NO.	

10-4





- Legend**
- Apply Pinyon-Juniper/Scopelorum Grass Mixture 105.84 Acres
  - P/J/S/D
  - Apply Airfax Grass Mixture 82.06 Acres
  - AD
  - Apply Hydrophytic Vegetation Mixture 0.8 Acres
  - HW
  - Plant Pinyon Pine/Juniper Tublings 23.04 Acres
  - P/J/U/T
  - P/J/S/D
  - PERMIT BOUNDARY
  - P POWER POLES
  - ROADS

Note:  
Seeding schedules to be used are in Figures 10-2, 10-3, and 10-4 of RMP.

REV	DATE	DESCRIPTION	BY	APP'D
△	6/11	EXCESS SPOL DISPOSAL AREA 2 CHANGES	AH	
△	11/10	BOUNDARY UPDATE	AH	
△	9/02	2002 PERMIT RENEWAL	AH	
△	8/95	ADDED PINYON PINE/JUNIPER	ND	

DESIGNED	AEB
DRAWN	ND/AJZ
CHECKED	AEB

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Sunnyside Cogeneration Associates  
**FINAL RECLAMATION SEEDING PLAN**

8-26-95
SCALE
PROJECT NO.



10-7