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May 24, 1994

TO: File, ACT/007/035, Folder #2

FROM: Ken Wyatt, Senior Reclamation Hydrologist 

RE: Crushing Facilities Addition Amendment Review, Sunnyside Cogeneration Associates, Sunnyside Refuse Pile, ACT/007/035, Folder #2, Carbon County, Utah

SYNOPSIS

On May 20, 1994, Sunnyside Cogeneration Associates (SCA) submitted an amendment to add the coal crushing facility located at the power plant site into the SCA plan.

ANALYSIS

Included in the submittal for hydrology were revised plates 7-1A, 7-3, 7-6, 7-18. Additional text was included to insert into the SCA plan. These included a new Chapter 7: Hydrology, Appendices 7-3 and 7-8.

An inspection schedule was included as table 5-1 which describes the inspection frequency for spoil piles, refuse piles and impoundments. This schedule shows the annual inspections and certifications for the East and West Slurry Cells, but does not show the annual sediment pond inspections and certifications as required by R645-514.311.

Appendix 7-3 in the plan includes all of the designs for the sediment ponds. In this amendment, the Coal Pile Sediment Pond (CPSP) was added to the SCA permit area and its design was submitted for inclusion into Appendix 7-3.

Appendix 7-8 includes the operational and baseline water monitoring schedule. As mentioned many times in the past, the permittee must monitor baseline water quality sites to acquire baseline water quality data. Following complete acquisition of the baseline data then these sites are to be monitored for operational parameters.

The permittee continues to submit information stating that baseline monitoring sites are separate from the operational sites. The permittee continues to submit the operational water monitoring sites as those described in the UPDES



permit. All UPDES permitted sites must be monitored in accordance with the UPDES permit. Baseline water monitoring should continue to be collected and then these sites will be monitored for the operational parameters.

Other editorial changes were incorporated into this amendment. Most were changes to numbers as a result of the additional pond being placed into the permit area. On page 2 of Appendix 7-8, the permittee has deleted the requirement to monitor the piezometers located in the refuse piles. This deletion was again done on page 700-21. These changes are not acceptable unless the permittee can justify these changes.

The CPSP design drawing and cross section are located on Plate 7-18. The watersheds are drawn on Plate 7-1A. The CPSP includes 1 watershed consisting of 2.0 acres. The pond is another 0.30 acres. These areas were digitized and matched very closely with those in the plan. Curve numbers used for the runoff analysis were adequate.

The pond volumes based on the maps provided were checked using OSM's TIPS, Earth Vision volumetrics utility program. These volumes based on elevations are provided in the table below. The volumes calculated were generally larger than those provided in the plan and are within acceptable limits.

PURPOSE	ELEV. (Feet)	CALCULATED VOLUME (Acre Feet)	PROPOSED PLAN VOLUME (Acre Feet)
Pond bottom	6476.0	0.0	0.00
Max. sediment level	6477.5	0.54	0.30 ¹
Primary spillway	6478.5	0.94	0.60 ¹
10 yr. 24 hr. storm	6478.0	0.74	0.14 ²
Emergency spillway	6479.5	1.39	0.90 ¹
Dam crest	6480	1.63	1.00 ¹

- 1: This value from the Sedimot II model for the 10 yr. 24 hr. event.
- 2: This value from the stage capacity curve on design plate 7-18.

Stage discharge and stage capacity curves are provided on the design drawing, Plate 7-18. Sedimot II was used to calculate runoff volumes, peak flows, and sediment loads. The numbers generated produced a sediment load of 1.4 tons and a runoff volume of 0.14 acre feet from the 10 year 24 hour event.

The 25 year 6 hour Sedimot model produced a peak flow of 2.2 CFS. The 6 inch CMP spillway is capable of discharging up to 0.9 CFS and in combination with the open channel emergency spillway the pond can pass the peak runoff from the 25 year 6 hour event.

Sediment calculations from the 10 year 24 hour event produced 1.4 tons of sediment. Converting this amount to a volume produces 0.001 acre feet of sediment per storm event. According to the volume analysis mentioned above the pond has 0.54 acre feet of sediment capacity.

The diversions associated with the CPSP are erroneously labeled in table 5. These diversions are labeled as CPR-Inlet and CPR-Outlet whereas on plates 7-1A, 7-6, and 7-18 these diversions are all labeled CPSP-D1 and CPSP-D2. The SCA plan designs diversion by two calculations for channel depth and riprap requirements. To calculate channel depth the maximum Manning's n value and a minimum channel slope are used to calculate the flow depth and then 0.5 feet was added to the channel depth to insure adequate freeboard. The maximum calculated flow depth was 0.84 feet. The permittee has stated in table 5 that the depth of these channels will be 0.8 feet. This does not provide the adequate freeboard.

The use of riprap is determined by calculating flow velocity using a minimum Manning's n value and a maximum channel slope. This was done for the two diversions associated with this pond. Velocities for these diversions are under 4.5 feet per second. No riprap will be installed. Again the permittee has stated: "All diversion channels will be monitored. If excessive erosion occurs, appropriate remediation is required." There is no discussion as to how these diversions will be monitored and what constitutes appropriate remediation.

RECOMMENDATION

This submittal can be approved and accepted when the following items are corrected.

1. The permittee must provide adequate justification for not continuing the monitoring of the piezometers or continue monitoring these piezometers.
2. Table 5 will need to be corrected.
3. The diversions design will need to be changed to include adequate freeboard. A discussion as to how these diversions will be monitored for erosion and

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what constitutes appropriate remediation will be required. When has excessive erosion occurred?

4. No slope is provided for the 6 inch CMP primary spillway shown on the cross section on Plate 7-18 and the maximum sediment level was not shown.

cc
Pam Grubaugh-Littig
Randy Harden