STATEMENT OF BASIS

Ground Water Discharge Permit No. UGW070002
Sunnyside Cogeneration Associates
Coal Ash Landfill

February 2012

A. DESCRIPTION OF FACILITY

The Sunnyside Cogeneration Facility is a coal-fired power plant that produces approximately 51 Mega Watts of electricity. The primary fuel stock for the plant is waste coal tailings that resulted from the operation of a large underground coal mine which operated for nearly a century. The plant's expected life is 30 years.

Burning the waste coal generates approximately 800 to 1000 tons of ash per day. The ash will be trucked to a disposal site approximately one mile from the power plant in the NW ¼ of Section 12, Township 15 South, Range 13 East, SLBM. The ash generated from the facility is excluded from the definition of solid waste and therefore no solid waste permit is required for this site. The site is located along a steeply sloping escarpment that faces south to southeast and terminates in a relatively flat area along Icelander Creek.

The existing Phase I Ash Disposal Facility is an unlined disposal landfill. Ash is placed in cells in a terrace-and-bench configuration. Terraces are 20 feet high with a slope of 2 horizontal to 1 vertical faces. Each terrace is set back 15 feet from the previous terrace to form a bench. The existing Phase 1 Ash Disposal Facility encompasses approximately 15 acres. Phase I is now closed, capped, and re-seeded according to approved specifications.

The Phase II Ash Disposal Facility is located immediately west of the Closed Phase I Ash Disposal Facility. Phase II is developed 2 cells at a time over a ten-year period, and will encompass approximately 32 acres of land. Phase II is nearly complete.

The Phase III Ash Disposal Facility is located immediately west of the Phase II Ash Disposal Facility. Phase III is developed 2 cells at a time over a ten-year period, and will encompass approximately 30 acres.

B. SUBSURFACE CONDITIONS

Ground water in the vicinity of the ash landfill is contained in isolated areas of alluvium overlying the relatively impermeable Mancos Shale. The individual areas of alluvium were deposited both from currently active streams such as Icelander Creek, as well as ancient streams and pediment gravels from an earlier cycle of erosion and deposition.

Ground water is also contained in weathered Mancos Shale underlying the alluvium. Near the landfill site, ground water issues from ancient pediment gravel at Whitmore Springs, and this flow recharges localized aquifers contained in recent alluvium, colluvium, and weathered Mancos shale associated with Icelander Creek. The Mancos Shale contains soluble salts, and in a regional sense there is natural degradation of ground water quality as the water moves from its source in the Book Cliffs and comes into contact with and flows through the Mancos Shale.

During the summer of 1994, the monitoring well farthest downgradient from the landfill, MW-1, exceeded the permit protection level for total dissolved solids (TDS), and has remained above that level since that time. This rise in TDS was not seen in Whitmore Springs or the other monitoring wells at the site. Subsequent investigations showed that the water from the other sampling points for this permit is similar in chemical composition to ground water of MW-1.

There is also a buried ridge of Mancos Shale under the alluvium that probably causes a separate ground water flow system west of the landfill that is sampled by MW-1. The chemistry of ground water in MW-1 is consistent with leaching from native materials at the site rather than from leaching from the ash in the landfill, which shows a different composition at all monitoring points. Because well MW-1 is probably not in a location that can be used directly to evaluate impacts from the landfill, the permittee has replaced MW-1 with MW-4 adjacent to the existing ash landfill runoff basin. The permittee is encouraged to voluntarily sample MW-1 even though it is not currently a compliance monitoring point, in order to build a historical record of water quality in the well. If submitted to DWQ, these analyses shall be entered into the administrative record for this permit.

C. BACKGROUND WATER QUALITY

Background ground water quality is summarized in Table 1 of the permit. These data represent the average of samples taken from Whitmore Spring from October, 1992 through July, 1995, and is very similar to the average composition of water sampled from monitoring wells MW-2 and MW-3. Separate background water quality information and protection levels are established for monitoring wells MW- 1, MW-2, MW-3, and MW-4 (Phase I and III) and MW-7 (Phase II). TDS concentrations are higher in the seeps.

D. GROUND WATER CLASSIFICATION

Based on available data, ground water at the landfill site varies from Class II Drinking Water Quality in wells MW- 1, MW-2, MW-3, and MW-4 (Phase I and III), to Class III Limited Use ground water in well MW-7 (Phase II).

E. BEST AVAILABLE TECHNOLOGY

Prevention of ground water pollution will be accomplished through the operation and final closure of the landfill. Ash is placed in 12-inch lifts and compacted. The landfill is configured into 20-foot terraces. A 15-foot bench is constructed at the top of each terrace. Drainage from the terraces is routed to the sedimentation basin at the toe of the landfill. A 16-inch vegetative cover soil is placed on top of each terrace and outslopes as it is finished. The final cover material shall have a hydraulic conductivity no greater than 1×10^{-3} cm/sec.

Sand Blanket drains will be installed over two identified seasonal seeps to facilitate drainage and to prevent up take by the ash-fill material. One seep is under the proposed landfill footprint and the other seep is just outside the proposed footprint. These drains will consist of sand placed above the seeps with a bentonite dam at the downgradient end. A screened PEP pipe will be placed 4" above the bedrock and will serve as the conduit for the seep water. Due to the pozzolanic property of the ash-fill, no synthetic liner will be needed. Any discharge will be diverted to the sediment basin described in the permit.

F. GROUND WATER MONITORING

The ash material does not produce leachate that contains any distinct tracer parameters that could be used to evaluate a discharge of leachate from the landfill. Analysis of simulated ash leachate shows no parameters in the leachate that are not also present in the ground water at the site. Protection levels have been established for metals that may be associated with ash leachate.

The primary threat to ground water quality from the landfill is from salts associated with the ash. In accordance with the Ground Water Protection Rules (UAC R317-6-4), TDS may not rise above 125 percent of background in a Class II ground water. At this site there is the possibility for natural variation of TDS to cause the background to exceed TDS protection levels, which are not caused by the landfill. Therefore, exceedance of TDS protection levels will be a cause for out-of-compliance status unless the permitee makes a satisfactory demonstration to the Executive Secretary that shows the rise in TDS is due to circumstances not related to landfill leachate (e.g., Mancos Shale).

The ground water chemistry in well MW-7 is significantly different from the other monitoring points in this permit. Therefore, separate background water quality and protection levels have been established based on samples taken from this well.

G. COMPLIANCE

All wells have been in compliance through out the period of this permit, with the exception of MW-2. Water quality data reported for well MW-2 on December 14, 2005 exceeded the protection levels for lead and TDS. In accordance with Part F above, the permittee has adequately demonstrated that these exceedances were not caused by the facility, but rather by suspected contaminated samples. Analytical results of monthly split samples reported that these constituents were below the permit protection levels.

Water quality data reported in July 2006 indicated elevated selenium concentrations in wells MW-1 and MW-2, and elevated TDS in well MW-7. In accordance with Part F above, the permittee has adequately shown, by means of comparative analyses, that these constituents are not the result of the facility, but from conditions caused by six years of drought. Although sulfate is the constituent causing elevated TDS, all TCLP analyses have reported non-detect concentrations for sulfate and selenium, which indicates that the facility is not the source. The same demonstration was made for selenium. Because the Mancos Shale is naturally elevated in sulfate and selenium, these constituents are likely leaching from the underlying Mancos Shale.

The most recent ash leachate TCLP analysis was submitted on June 6, 2006, which satisfies the condition in Part I.E.5.d of the Permit.

G. PERMIT TERM

The revised permit will be subject to renewal in 2017.

F:\RHerbert\wp\Sunnyside\SUNNYSIDE 7.SOB.doc