SOUTHERN MONTANA ELECTRIC
GENERATION & TRANSMISSION COOPERATIVE
HIGHWOOD GENERATING STATION

SOLID WASTE MANAGEMENT PLAN – SUMMARY

Background:

Southern Montana Electric Generation and Transmission Cooperative's (Southern Montana Electric G&T's) Highwood Generating Station (HGS) will combust low sulfur Powder River Basin (PRB) coal in a Circulating Fluidized Bed (CFB) boiler to produce steam used in the production of central station electric energy for its member systems. The solid waste byproduct of the combustion process will be approximately 225 tons of fly and bottom ash that will need to be disposed of in an environmentally acceptable process on a daily basis. In addition to the fly and bed ash there will be approximately 2.0 tons of solid waste byproduct produced by the raw water treatment facility on a daily basis.

The solid waste byproduct of the raw water treatment facility will be sediment concentrate naturally occurring in raw water taken from the Missouri River for use at HGS. The sediment concentrate resulting from the raw water treatment process will be further processed by passing the material through a filter press to reduce residual moisture. At this point the sediment concentrate or "filter cake" will have a consistency well suited for transportation and disposal.

Depending upon yet to be determined requirements of the Montana Department of Environmental Quality (MDEQ), the solid waste byproduct of the raw water treatment process may be deposited in the onsite monofill disposal site where the fly and bed ash will be contained. If the disposal of the "filter cake" at the onsite monofill containment facility is not acceptable to MDEQ, the material will be trucked to a nearby State of Montana licensed landfill operated by a private company currently under contract with the City of Great Falls for the purpose of disposing a wide variety of waste materials.

The Montana Solid Waste Management Act exempts the onsite disposal of solid waste that is the combustion byproduct of electric production facilities. However, MDEQ has clearly stated its goal of developing regulations specific to the containment of materials at industrial waste monofill facilities – including monofill facilities used for the containment of combustion byproducts from electric generation facilities. Southern Montana Electric G&T has met with MDEQ to explain its preferred solid waste disposal option. In the context of that meeting, Southern Montana Electric G&T committed to working with MDEQ on a voluntary basis in the development of appropriate requirements for the onsite disposal of solid waste byproducts produced at HGS.

Process:

Southern Montana Electric G&T conducted a detailed examination of two alternative solid waste disposal plans. The process utilized in the selection of a preferred option included the development of a preliminary design of a monofill solid waste containment facility, cost estimates specific to the respective option, and a review of the contemplated option's impact on the environment. A summary of the two options receiving consideration is as follows:

Option 1: This option called for the containment of the coal combustion byproduct in a naturally occurring indentation (coulee) that had been properly prepared to receive the fly ash, bed ash and possibly the filter cake. The location of the onsite solid waste disposal would have been a portion of the property secured for HGS. This option would have required Southern Montana Electric G&T to line the proposed location with "clay" or some other suitable material that would "contain" the material once it had been deposited in the monofill. This option would also have included requirements to install earthen dams to restrict the flow of storm water into the containment area, a piping system to relocate water captured in the diversion structure, and "catch basins" below grade in the monofill structure to ensure that water collected within the perimeter of the monofill structure would receive proper treatment and handling.

It was determined that this option was technologically feasible. However, the use of naturally-occurring indentation would have required extensive grading to develop the proper sloping for the containment facility. The possibility of a breach of the storm water containment system was also a concern.

Option 2: This option called for the disposal of coal combustion byproduct and the filter cake within the confines of the rail loop adjacent to the generating facility. The area within the rail loop would be laid out in a rectangular grid consisting of approximately 100 acres or fifteen five-acre parcels. The grid would be three parcels wide and five parcels long. The fifteen 1,700 by 2,300 foot cells could be opened one at a time on "as needed" basis with an estimated byproduct storage capacity of approximately three years. The monofill facility would have a storage capacity for solid waste byproducts commensurate with the estimated life of the facility – in excess of 35 years.

The rail loop and waste material storage cells would be located on a parcel of land that is relatively flat as is typical for fuel unloading and related rail activities. Each cell would be excavated to a depth of 36 feet and have an estimated combustion byproduct storage capacity of 36 months. The monofill cells would be designed as self-contained units with clay liners. As each cell is filled, a layer of compacted clay would be placed over the waste material at prescribed intervals until the cell is filled to a predetermined height. The final stage in the monofill process, at an above-grade height of 22 feet, would be a vegetation-sustaining layer of topsoil held in reserve from the process of opening an adjacent storage cell. All storage and reclamation materials necessary for this process can be found onsite.

As was the case with Option 1, a storm water containment plan would be implemented to ensure proper treatment of storm water that comes in contact with waste material slated for storage in the onsite containment facility. Storm water that comes in contact with waste materials would be captured via earthen dam structures and pumped to a storage/evaporation pond to ensure preservation of existing runoff water quality.

It was contemplated that an acceptable maintenance, operation and monitoring plan would be developed for both options in conjunction with MDEQ.

Conclusion:

On the basis of cost, operating flexibility, and potential environmental risk, Option 2 has emerged as the preferred option for the storage of coal combustion byproduct. If determined appropriate by MDEQ, Option 2 will also serve as a means of containing the filter cake resulting from the treatment of raw water for use at the HGS. Please note that the final requirements for cell lining, groundwater monitoring, and other related operational requirements will be developed in concert with MDEQ staff. Southern Montana Electric G&T is most willing to work with MDEQ to develop a model solid waste containment plan that will responsibly contain monofill waste material produced at HGS in an environmentally sensitive fashion.