

# **Evaluation of Constructed Wetlands for Reducing Sulfate Concentrations in Water Impacted by Leachate from Coal Combustion Products**

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## **ABSTRACT**

The Faulkner Fly Ash Storage Site in Charles County, Maryland was established in 1970 to handle, in an environmentally sound manner, the large quantities of coal combustion products (CCPs) produced at the nearby Morgantown Generating Station. CCPs stored at the site have generated leachate, characterized by low pH and elevated metals and sulfate, that has degraded water quality in the area hydraulically downgradient of the facility. A series of cutoff walls and drains completed at the facility capture and direct groundwater through a series of organic-rich reactive cells, limestone beds, and wetlands to treat the acidity, metals, and sulfate present in the leachate-impacted groundwater.

Initial monitoring data indicate that the constructed wetlands are decreasing concentrations of metals and adjusting pH in surface water. However, sulfate concentrations in the treatment system effluent and groundwater downgradient of the facility remain elevated. The Maryland's Power Plant Research Program (PPRP) initiated research in January 2004 to evaluate the efficiency of the passive water treatment systems to reduce sulfate concentrations in surface and groundwater. The study results will assist in correcting a localized impact from the long-term storage of CCPs and provide technical guidance for using constructed wetlands to improve water quality impacted by CCPs.

The study consisted of an evaluation of vegetative growth, reactive materials and residence time for water in the system. Results indicate that continued maturation of the vegetation and microbial communities in the wetland are decreasing sulfate concentrations and that amendments to the substrate may further promote sulfate reduction.

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