

HYDROLOGIC CHARACTERIZATION OF WETLANDS IN SURFACE COAL MINELANDS OF NORTH DAKOTA¹

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Abstract: Besides providing habitat for water fowls and other wetland species, the Coteau Prairie wetlands in the Fort union Lignite Region of western North Dakota play important role in recharging shallow ground water aquifers. During surface mining of coal and reclamation of minelands, the mitigation for reconstruction of wetlands is based on equivalent replacement of hydric soils and hydrophytic vegetation. Given the semi-arid climate of the region, the reconstructed wetlands may meet the "duck test" of premine surficial functions in wet years, however, the desired near-surface and sub-surface hydro-ecological attributes may not be sustainable in normal to drier years.

A study on comparative hydrology of various types of wetlands associated with the surface coal minelands of North Dakota was initiated in 1992-93. the research project aims to characterize both surficial and subsurface hydrologic processes of premine versus postmine wetlands and evaluate their potential for ground water recharge and sustainability as surficial bio-habitats. Six wetland locations, two each from landscapes representing natural Coteau Prairie, abandoned minelands, and reclaimed minelands are instrumented with electronic data loggers to continuously monitor near surface micro-meteorological parameters of rainfall, solar radiation, wind speed, relative humidity, and air , water and soil temperatures. We also periodically monitor water surface elevations on wetland ponds, on water table piezometers, and evaporation pans and sample water for macro-quality parameters of total dissolved solids, ph, electrical conductivity, total cations and anions. The proposed presentation will describe the instrumentation and discuss preliminary observations from the study.

Additional Key Words: Prairie pothole, reconstructed wetland, AML wetland, water balance, groundwater recharge.

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