COALBED NATURAL GAS (CBNG) WATER QUALITY TRENDS IN THE POWDER RIVER BASIN, WYOMING

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Abstract: Due to the growing demand for energy resources, the Power Basin is booming with Coalbed Natural Gas production (CBNG). In the process of extracting the methane from coal seams, a large amount of ground water is brought to the surface. The produced water can be very useful in the water-limited region of Wyoming, but beneficial use may be hindered by potential water quality problems. To assess these problems a water quality monitoring study began in the Powder River Basin in 1999. Ten years of data will be compiled to identify trends in the water quality over time to determine the potential beneficial uses of CBNG water.

The study took water samples of CBNG produced water outfalls and the corresponding discharge ponds. Measurements taken at the site included dissolved oxygen, pH, electrical conductivity, oxidation-reduction potential, and temperature. The water samples were later analyzed for Ca, Na, Mg, K, Fe, Al, Cr, Mn, Pb, Cu, Zn, As, Se, Mo, Cd, Ba, B, SO_4, Cl, F, NO_3, and PO_4. The water was also titrated with HNO_3 in order to determine alkalinity. Subsequently, MINTEQ2 was used to determine the elemental species present in the water samples. A trend analysis of repeated measures will be used to identify water quality trends.

Additional Key words: Water Quality Monitoring, Produced Water, Discharge Ponds, Outfalls

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