



Title: Evaluation of Coalbed Methane Product Water Quality for Irrigation Use

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Organization: University of Wyoming

State: WY **Region:** Northern Plains and Mountains **Year of Funding:**

Theme: Watershed Management

Situation: Wyoming is in the forefront of the coalbed methane (CBM) development. Currently, sixteen thousand wells are in production in WY and this number is expected to go up to sixty thousand. Estimates suggest approximately two trillion liters of groundwater will be discharged (product water) from the extraction of CBM. Often two to ten extraction wells are combined together into one discharge point and product water released into unlined disposal ponds and/or stream channels.

Objectives: The objective of this research was to evaluate quality of coalbed methane product water for irrigation use.

Methods: Coalbed methane product water samples from wellhead and corresponding ponds and stream channels were collected from different watersheds in the Powder River Basin, Wyoming. Samples were monitored over a period of 2 years for salinity, sodicity, and trace metals. From these measurements quality of coalbed methane product water was compared with irrigation water quality.

Partnerships: This research created a network of working partners including local landowners, citizens, coalbed methane industry, and state and federal water quality managers.

Research: This project integrated research and education to develop an outreach program for coalbed methane product water quality. Research data and technology was transferred to user groups through meetings and workshops.

Resources: The National Water Quality Program funds were useful in conducting and completing coalbed methane product water education and outreach program.

Results: Results suggested that salinity and sodicity of coalbed methane product water increased from south to north and from east to west in the Powder River Basin. No consistent trends were observed for trace metal concentrations in coalbed methane product water across the Powder River Basin. This research produced several journal articles and conference proceedings papers and also resulted in several regional, national, and international presentations.



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