WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2004MT34B

Title: Investigation of microbial ecology, structure, and function in coalbed aquifers: Powder River Basin, Montana

Project Type: Research

Focus Categories: Hydrology, Ecology, Conservation

Keywords: aquifer, preservation, methanogenesis, sustainability

Start Date: 03/01/2004

End Date: 02/28/2005

Federal Funds: $15,128

Non-Federal Matching Funds: $30,287

Congressional District: At large

Principal Investigators:
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Abstract

Coalbed aquifers supply critical water resources to vast regions in southeastern Montana. Currently, these aquifers are being dramatically impacted by conventional coalbed methane (CBM) development and, as concerns of global warming increase, speculation that these aquifers may serve as repositories for industrial CO2 suggests that additional impacts are likely for the future.

The origin of CBM in the Powder River Basin (PRB) is the result of microbial processes (biogenic methanogenesis). The success of CO2 sequestration strategies will likely be a function of microbial activities as well. The purpose of the proposed research is to identify the structure, diversity and presumptive function of the total microbial community within a specific methane-bearing coalbed aquifer in the PRB and conduct culture-based investigations that will help delineate the kinetic rates and pathways for methanogenesis. Our goal is to generate data that will support more advanced studies of in situ gasification of coal as it relates to methanogenesis, CO2 sequestration, and the development of technologies appropriate for sustainable methane development. We

foresee the value of these data as a means of moving us toward a philosophy of harvesting CBM rather than simply mining this resource at the expense of our groundwater resources.