# Coalbed Methane Investigations in the Tongue River Basin[AFS]

Carol Endicott
Confluence Consulting
211 North Grand Ave., Suite E, Bozeman, MT 59771-1133
cendicott@confluenceinc.com

Coalbed methane (CBM) is an emerging energy resource in many western states. Ground water, often rich in salts and other toxic constituents, is a by-product of CBM development. Management of this water presents a considerable challenge to methane producers and regulatory agencies. We conducted this investigation to assist decision making with regard to fate of the produced water. One component of this study was a review of the literature addressing effects of dissolved solids on fish, macroinvertebrate, and aquatic plants. In addition, we conducted assessments of the biological, chemical, and physical integrity of streams in the Tongue River basin using protocols developed by the EPA. These assessments provided both baseline data on streams likely to be influenced by CBM development and upstream/downstream comparisons of streams where CBM development was already occurring. A primary conclusion drawn from the literature review was that different taxa demonstrate wide variation in response to dissolved solids. Therefore, predicting effects based on laboratory tests is overly simplistic and unlikely to protect overall biological integrity. Baseline assessments of tributary streams in the Tongue River basin indicated varying levels of biological, chemical, and physical conditions among streams due to variation in land use, geology, and water quantity. Comparisons of streams above and below CBM development suggested that elevated dissolved solids may have deleterious effects on fish and aquatic life, however, drought and local geology may also be contributing factors. We recommend additional investigation to pinpoint sources of salts in the impacted stream. Finally, we recommend that methane producers and agencies collect baseline data to identify sensitive areas and adaptively manage CBM development.