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Identifying and Remediating High Water Production in Basin Centered Formations

Low-permeability formations in ''basin-centered'' settings are projected to be an important component of the future domestic natural gas resource base. The potential of this resource is being questioned as operators encounter high volumes of moveable water in deep basin settings. Understanding the nature of moveable fluids in these basin-centered settings is essential for developing strategies and techniques to avoid or remediate high water production. Advanced Resources International and the Department of Energy are performing a research program (DE-FC-02NT41437) to characterize the nature, distribution and flow paths of moveable fluids in the subsurface of several low permeability Rocky Mountain basins in order to improve resource characterization, develop water remediation strategies and enhance gas recoveries in these resource rich basins.

Initially, the project will focus on design and construction of a high-quality water chemistry database in the Wind and Green River basins incorporating available historical and current formation water chemistry data. Water composition data will be used to deduce depositional environments and diagenetic alterations to the formation waters and construct models describing the distribution and movements of the waters in the subsurface. The models will be used to devise strategies for the avoidance or remediation of moveable waters in the subsurface. A field demonstration of the strategies will be performed in the Wind River Basin and the results made public through technology transfer.

Final deliverables for the project will include an ''atlas'' of Rocky Mountain produced water compositions, a folio of conceptual models, a field demonstration with post appraisal, and a workshop.