

Groundwater control and management for oil shale recovery

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The control and management of groundwater will be a significant consideration for development of a large-scale oil shale industry in the Piceance Basin. The kerogen-bearing rocks in the Basin lie within the saturated zone, which has variable permeability depending on depth and location in the Basin. Some Uinta Formation sandstones and leached marlstones in the Parachute Creek member of the Green River formation are quite permeable whereas zones with high-grade oil shale may have a very low permeability. However, groundwater flow will be an important issue for most oil shale recovery operations. For example, a study of water management for oil shale done by the Bureau of Mines in 1977 indicates that inflow rates to either a conventional oil shale mining operation or an *in-situ* operation may range from about 5,000 to over 20,000 gpm depending on the location in the Basin and the type of operation. It is clear that any oil shale recovery operation will need to consider methods of controlling and managing groundwater flow both during and after the recovery process. There are a number of methods for groundwater control and management that have been developed for open pit, underground and *in-situ* mining operations. These range from dewatering well systems to underground drainage galleries and freeze walls. This presentation provides an overview of the methods of groundwater control used in the mining industry and describes how they may be relevant to an oil shale recovery operation.