

Title:

Field Techniques for Quantifying the Vertical Permeability Characteristics of Oil Shales

Abstract:

Determining the field vertical permeability characteristics of oil shale sequences is a critical component of evaluating the feasibility of in-situ oil shale processing strategies. Vertical permeability, thickness, and continuity of units above and below the in-situ process zone largely determine their potential to prevent excessive vertical ground water inflow and to contain process gases. Combined with lateral permeability control and appropriate geotechnical constraints, laterally continuous confining layers are an important element of a containment strategy for in-situ processes. While numerous field testing techniques for lateral permeability measurement have been developed, methods for vertical permeability measurement are not well established. Influences of secondary permeability features in oil shales such as fractures and dissolution features complicate test analysis. A new technique for field measurement of vertical permeability is presented, along with examples of tests from the west-central part of the Piceance Basin. Interpretation of test results is performed using numerical techniques and incorporates data from other sources such as geologic descriptions from core and petrophysical logs.