Unsaturated Hydraulic Properties of Uncontaminated WMA S-SX Vadose Zone Sediments

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A Field Investigations at Representative Sites Task of the Groundwater/Vadose Zone Integration Project

Objectives:

- use science to improve characterization of unsaturated flow and transport
- develop/revise methods for measurement of unsaturated flow and transport properties that can be applied to field and laboratory-packed cores
- provide parameters for describing unsaturated flow and transport in Hanford sediments
- provide data related to hydraulic property variability in Hanford sediments
- help develop a data base upon which comparisons can be made to measurements in contaminated Hanford sediments to evaluate if changes in hydraulic properties resulted from leakage of high salinity/caustic waste solutions from the S-SX tank farm

Approach:

- use a flux-controlled boundary condition from which transient and steady-state measurements are made to assess unsaturated flow and transport parameters

- use core material collected in an uncontaminated area adjacent to the S-SX tank farm

- compare experimental results from using modified tempe-cell, centrifuge, and multi-step outflow measurement techniques on similar media


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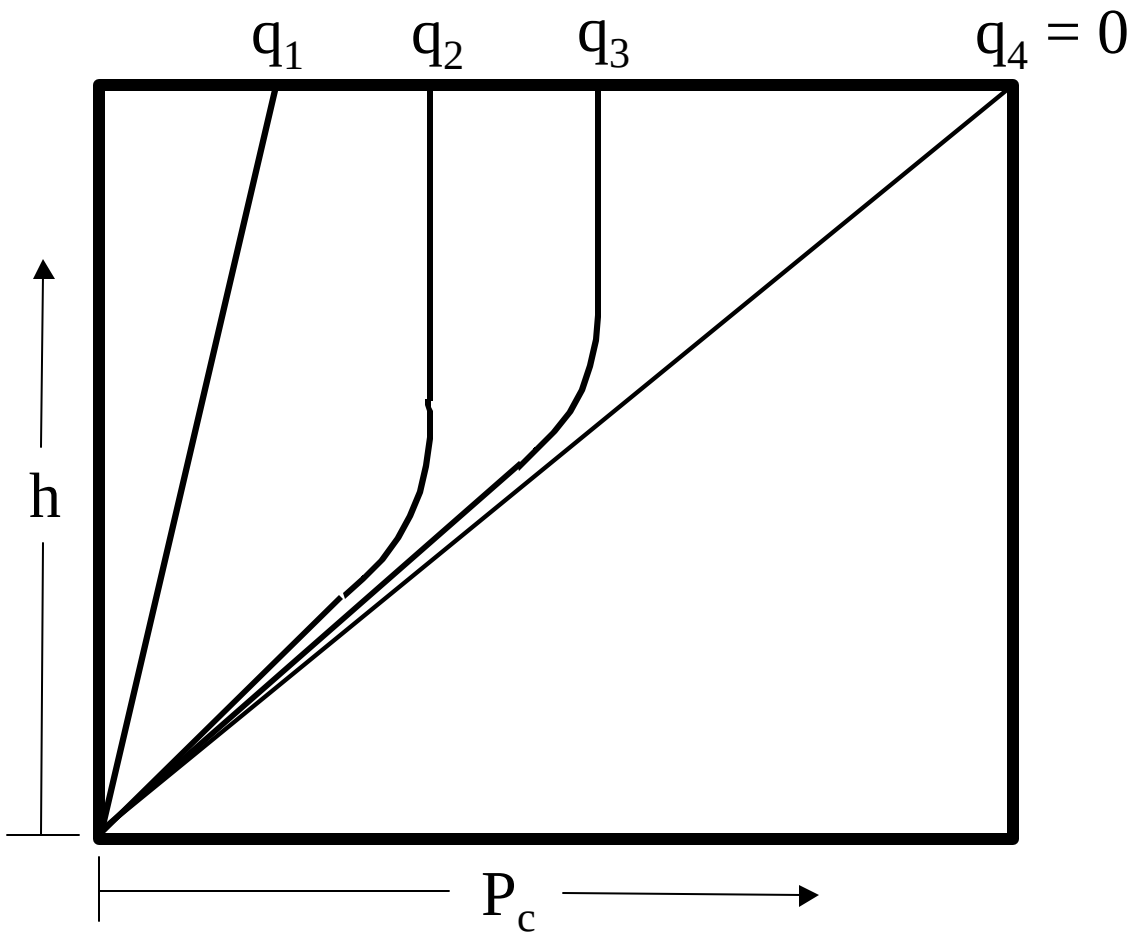
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Expectations:

- improve methods for characterizing unsaturated flow and transport properties

- obtain a better description of unsaturated flow and transport characteristics of Hanford sediments

- obtain a better understanding of any relationships between measurement technique and unsaturated flow parameters

Vadose Zone Science & Technology Needs:

- improve conceptual models of current contamination distributions
- provide a basis for forecasting future movement of contaminants
- new and improved tools to characterize the vadose zone

Field Investigation at Representative Sites:

- enhance understanding of key features and processes for geochemistry, hydrology, and hydrochemistry

Integration:

Vadose Zone Transport Field Study:

- collect data sets under controlled conditions at uncontaminated sites to verify conceptual and numerical models

Vadose Zone Transport Modeling

- develop numerical models and parameters for fate and transport through the vadose zone

Linkages:

- **System Assessment Capability**
- **RPP Tank Farm Vadose Zone Project**