

SBIR PROPOSAL EVALUATION FORM

FY94

PHASE I

Proposal No. I-2

Proposer: Aquaius Engineering

Title: A New Modeling Tool for Capillary Barriers

Overview: This proposal addresses the topic area "Analytical methods or models addressing unsaturated soils or unsaturated fractured rocks" with research to develop a model for steady-state flow in capillary barriers that will be far more accurate and efficient than existing codes. The model proposed would be appropriate for waste-site assessments that rely upon the capillary-break concept to limit infiltration into the waste as well as other environments that are characterized by extreme contrasts in adjacent material properties.

Strengths: The area of proposed research is particularly vexing for existing codes; many codes fail when applied to this problem while others are unable to directly solve the elliptic (steady-state) form of the problem, inefficiently approaching it as a transient problem. The proposal provides substantial support for the feasibility of the research and the potential to increase the accuracy and computational efficiency of existing or future models. The enhancements proposed are at the leading edge of the state of the art in the application of numerical methods to flow and transport through variably-saturated soil and rock. The principal investigator is uniquely qualified to develop these innovations and could easily obtain sufficient technical resources (computer and peripherals) to support the research. The phase I effort would certainly demonstrate the feasibility of the concept prior to the application for subsequent phases of research.

Weaknesses: None.