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Numerical Simulation of the behavior and mobilization of fine-grained quartz particles in porous media MICHAL HRADISKY, Utah State University, JEFFREY ALLEN, The United States Army Corps of Engineers, THOMAS HAUSER, Utah State University — The presentation focuses on the simulation of mobilization, deposition and detachment of fine-grained, quartz particles (hereafter referred to as “fines”) to silica grains. Colloidal and hydrodynamic forces are computed and evaluated. In addition, the effects of differing levels of alkalinity and electrolyte concentration are evaluated per the Happel’s model and the Derjaguin-Landau and Verwey-Overbeek (DLVO) theory. This theory allows for the initial attachment of the fine particle to the surface of a silica grain, by assuming that the electrolyte concentrations of the fluid medium are sufficiently high to warrant the domination of the attractive Van der Waal’s forces. Multi-grained three dimensional simulation results for a centered cubic packing structure are presented.

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