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Article

Experimental Investigation of the Effects of Porosity, Hydraulic Conductivity, Strength, and Flow Rate on Fluid Flow in Weakly Cemented Bio-Treated Sands

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Supplementary Materials

The Darcy radial flow equation has been used to calculate the pressure differential and the results are plotted against the peak pressures obtained in the tests. It accounts for the flow rate and permeability but does not for strength: $Q = \frac{2\pi \cdot k \cdot h \cdot \Delta p}{\mu \cdot \ln(\frac{r_e}{r_w})}$, $\Delta p = \frac{Q \cdot \mu \cdot \ln(\frac{r_e}{r_w})}{2\pi \cdot k \cdot h}$.

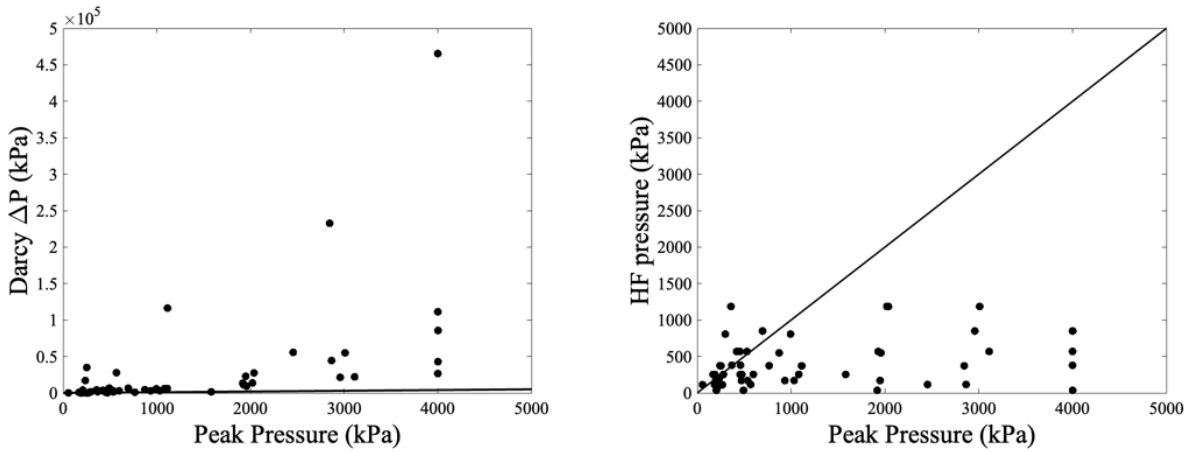

Figure S1. (a) The pressure differential and (b) the HF pressure Versus the peak pressure obtained in the experiments.

Results (**Figure S1** (a)) suggest that the pressure differential provides reasonable fits to the experimental data only at low flow rates while at faster flow rates the obtained pressure differential is quite high.

The hydraulic fracturing tensile criterion has been also used to relate with the peak pressures (**Figure S1** (b)). This criterion underestimates the peak pressures as expected as it does not account for the permeability and flow effects.