

# **Luz Puentes Jácome**

Thesis

An Investigation on the Influence of Wettability on the Recovery of Entrapped LNAPLS via Surfactant Flushing

Abstract

Light non – aqueous phase liquids (LNAPLs) released into the subsurface constitute long term sources of contamination. Pump and treat systems do not effectively remove residual and entrapped LNAPLs. Wettability has been found to be essential in contaminant transport and soil remediation where non-ideal or mixed wettability conditions may exist. This study investigated the influence of wettability on the recovery of entrapped LNAPLs via surfactant flushing. Wettability, capillary pressure-saturation, and column tests were performed using a lab-grade fluid (heptane) and a field LNAPL. Wettability and column tests conducted on the field LNAPL showed evidence of non- ideal conditions. Overall results indicated that fluid entrapment was independent of fluid type, wettability and contact time. Entrapped LNAPL removal by mobilization occurred as a result of interfacial tension reduction at a surfactant concentration of 0.5 g/L. Entrapped NAPL removal from fractionally-wet columns was higher in comparison to water-wet columns and increased with contact time.

Keywords: Wettability, LNAPLs, fluid entrapment, surfactant flush, column tests.

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