# Supplementary information

S. 1 Sample description and geochemistry taken from Hernandez-Becerra et. al, 2023. Concentrations in ppm.



S. 2 XRD patterns of hydraulic fracturing raw solids (without washing with deionized water step to remove NaCl)



S. 3 Experimental cultures. A) T0 (before inoculation) and B) T4 (after 4 weeks of incubation). The positive control treatment was set up with ferrihydrite as the electron acceptor.

A group of glass jars with brown liquid in them

Description automatically generated with low confidence