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ACCEPTED MANUSCRIPT

Control of microbial sulfide production by limiting sulfate dispersal in a water-injected oil field

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Highlights

- Microbial conversion of injected sulfate to sulfide (souring) is a problem for oil companies
- Nitrate injection, stimulating subsurface nitrate-reducers, is used to combat this problem
- Sulfide removal by reservoir rock allows sulfate free water generation by a two stage injection
- Use of this technology allows injection of less nitrate
- Injection of nitrate and sulfate free water changes the community in oil field produced waters

ABSTRACT

Oil production by water injection often involves the use of makeup water to replace produced oil. Sulfate in makeup water is reduced by sulfate-reducing bacteria to sulfide, a process referred to as souring. In the MHGC field souring was caused by using makeup water with 4 mM (384 ppm) sulfate. Mixing with sulfate-free produced water gave injection water with 0.8 mM sulfate. This was amended with nitrate to limit souring and was then distributed fieldwide. The start-up of an enhanced-oil-recovery pilot caused all sulfate-containing makeup water to be used for dissolution

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