

High-Energy In-Situ Injection of Modified Clay for Sequestration of PFAS

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Technology Description

- Modified Clay (MC) product manufactured by CETCO and offered in multiple particle sizes; the smaller particle sizes are used for injection applications and larger particle sizes area used for direct soil mixing and pump and treat applications
- High sorption capacity and not significantly affected by co-contaminants (e.g. petroleum hydrocarbons, TCE), Figure 1
- Can be applied via direct push injection (Figure 2) or via soil mixing (Figure 3)
- Compared to activated carbon, it has a larger sorption capacity and higher sorption kinetics (Figure 4)
- Can be combined with other in-situ technologies to remediate co-contaminants such as petroleum hydrocarbons, chlorinated solvents, and heavy metals

Technology Applications

- AST performed injection field trials of Fluoro-Sorb (Powdered and 100 particle sizes) in 2022 in order to determine injectability and radius of influence (Figures 5-7)
- It was determined that the products injected and distributed similarly to other commercially available solid particle injectates
- First injection field trial (on PFAS contaminated site) completed in 2023 at military base in Canada
- Funnel and gate PRB application completed in 2022 (Figures 3 and 8)
 - Three (3) weight percentages of Fluoro-Sorb (2.5, 5, and 7.5 w/w) were mixed into the treatment calls with clean sand
 - 99+% PFAS reductions at 180 days post mixing

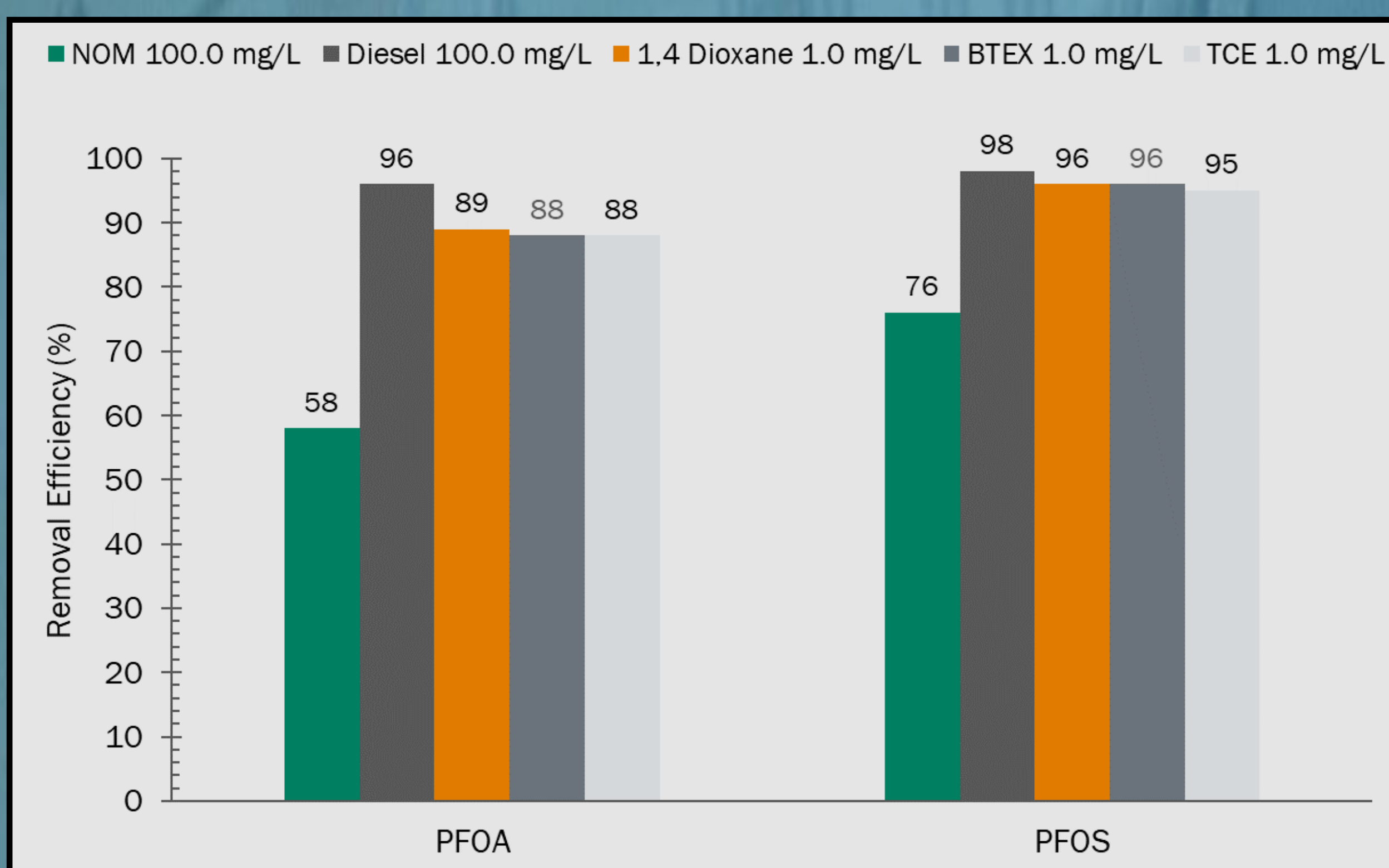


Figure 1. 40 mg Fluoro-Sorb + 500 mL groundwater; 7 day equilibrium

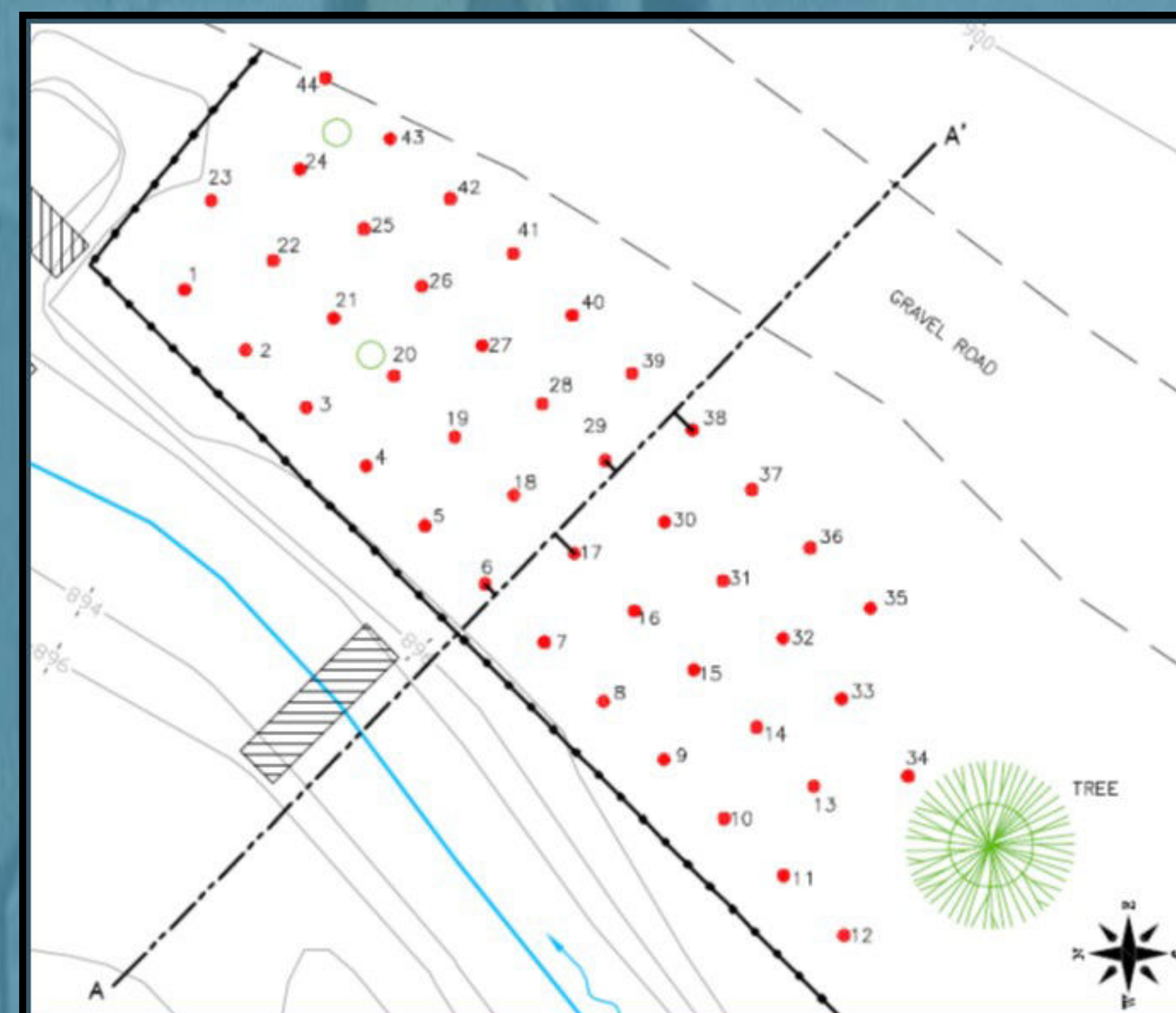


Figure 2. Example of Injected PRB

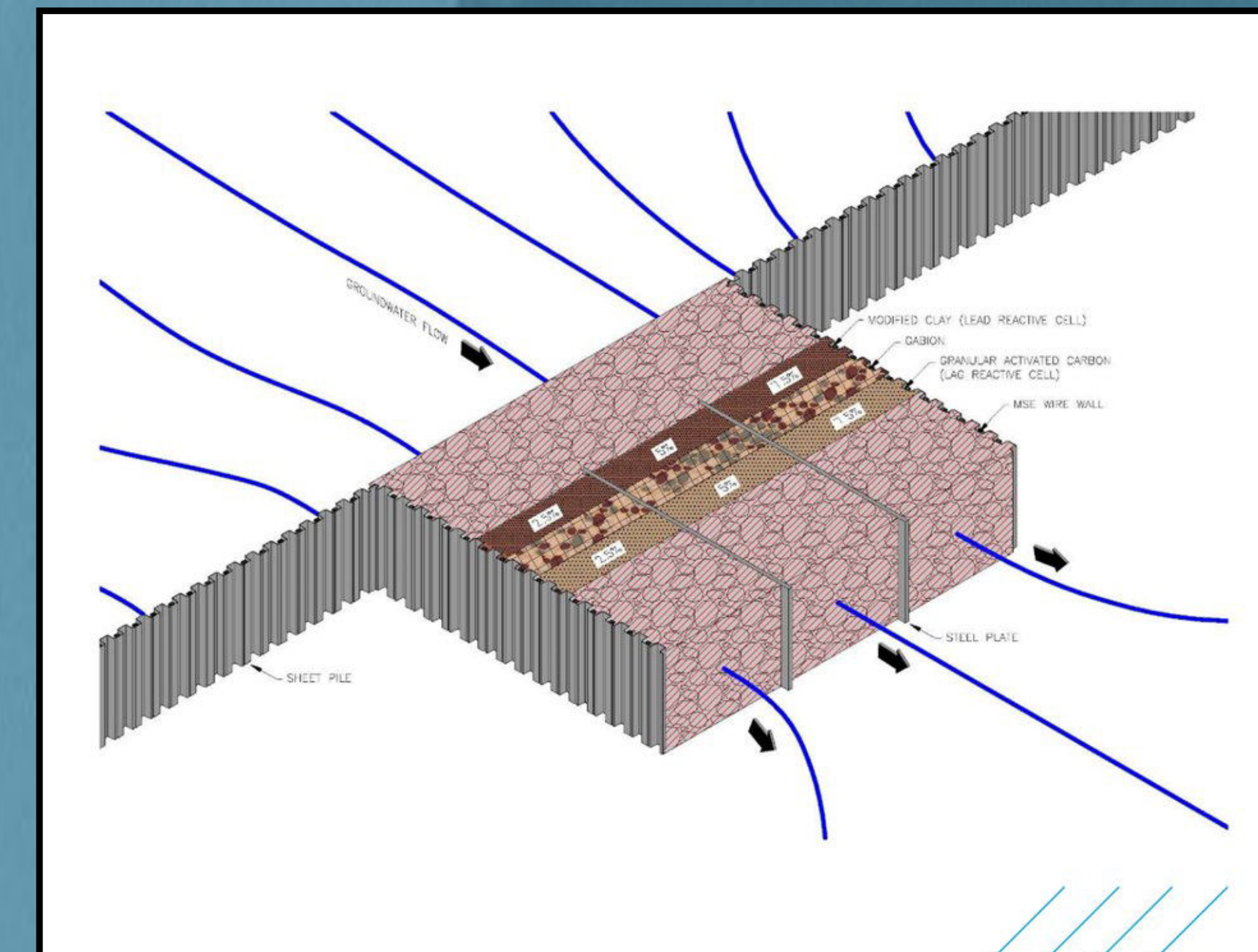


Figure 3. Example of Trenched Funnel and Gate PRB

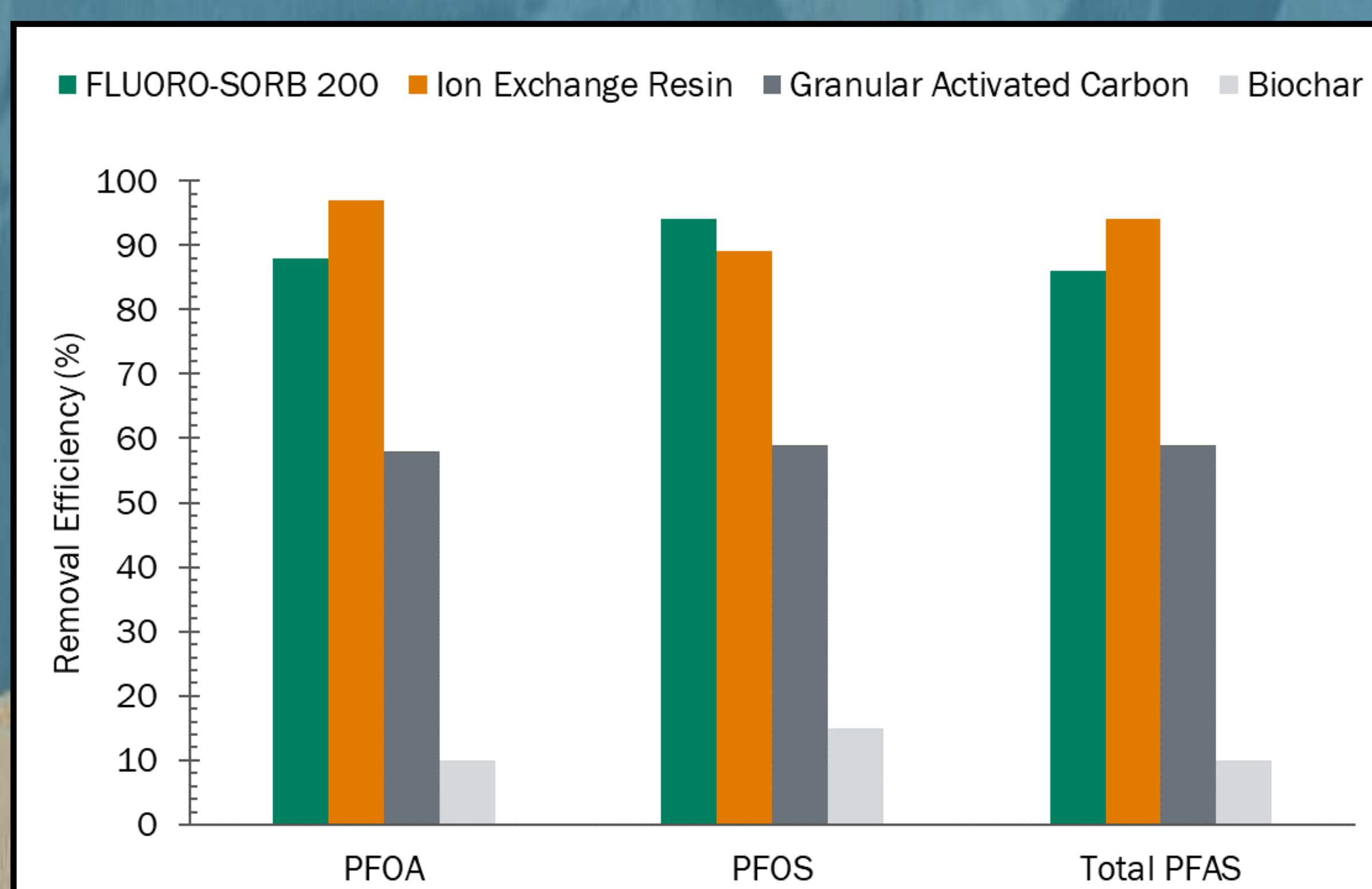


Figure 4. Removal Efficiency for Various Adsorbents



Figures 5-7. Direct Push Injection Field Trials

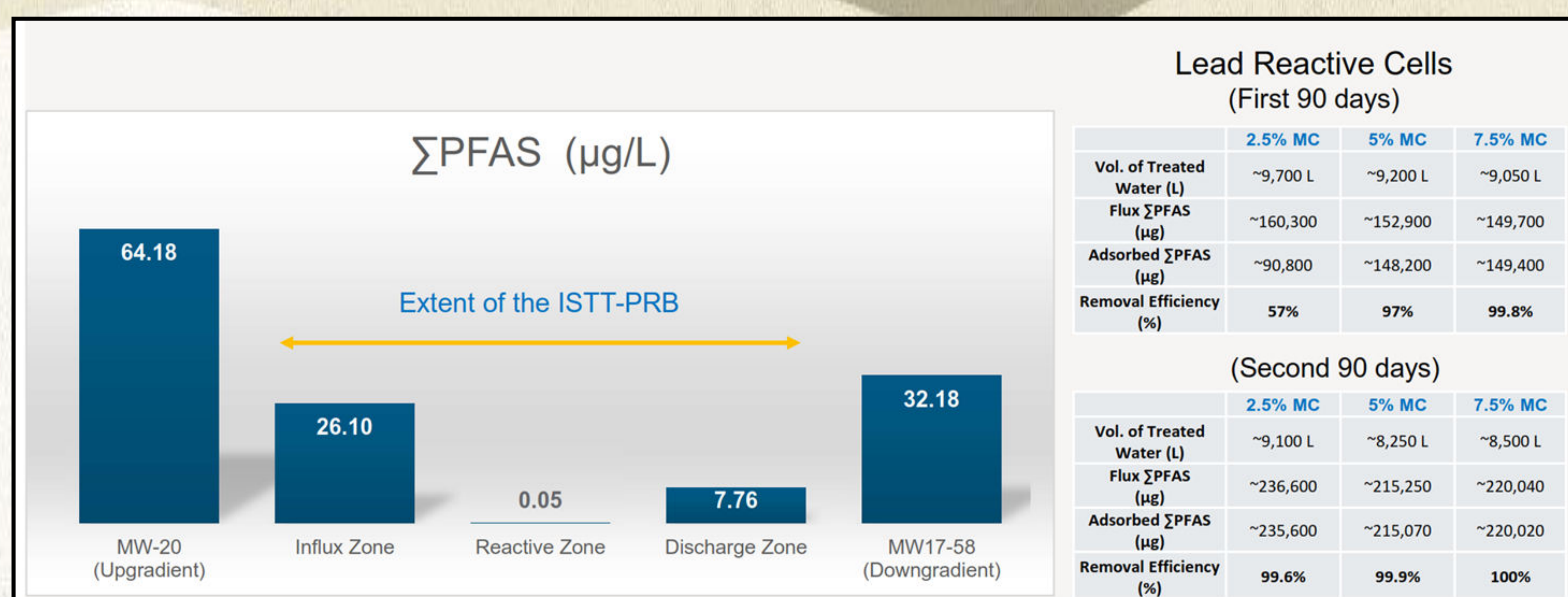


Figure 8. Funnel and Gate PRB Field Data