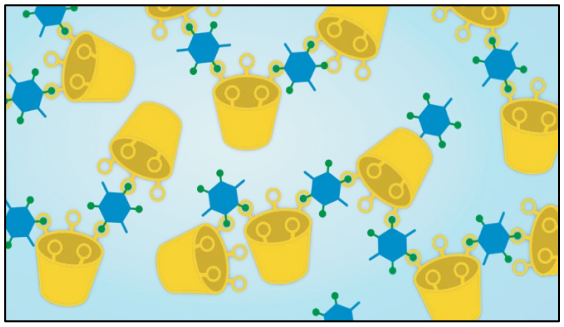
PFAS TECHNICAL SUPPORT FOR NOVEL TREATMENT TECHNOLOGIES

CITY IN NORTHERN CALIFORNIA

Treatment technologies that provide cost-effective and energy efficient PFAS removal are essential to meet the evolving and ever more stringent state and federal water quality standards. To that end, EKI prepared a treatability study for the removal of PFAS from groundwater, comparing a novel adsorbent (DEXSORB+, Cyclopure, Inc.) with traditional granular activated carbon (GAC) using rapid small-scale column tests (RSSCTs) and PFAS-impacted groundwater. DEXSORB+ is a cyclodextrin-based adsorbent derived from corn starch.



Schematic of the first high surface area β-cyclodextrin polymer adsorbents (DEXSORB).

EKI partnered with Cyclopure, Inc. to perform these bench-scale tests. The practical performance of DEXSORB+ and GAC in packed bed filtration systems was simulated by replicating full-scale flow-through processes using bench-scale RSSCTs. PFAS-impacted groundwater was collected from supply wells at a water utility in Northern California. RSSCTs were conducted with the PFAS-impacted groundwater to accurately evaluate the treatment capacity and breakthrough behaviors of a mixed matrix of PFAS. These experiments provided valuable insights into the removal of PFAS from impacted groundwater by DEXSORB+ and GAC.

PFAS were effectively removed by both adsorbents and were initially removed below laboratory reporting limits. Presently, GAC has several advantages over DEXSORB+ including regulatory acceptance as a drinking water treatment technology and its high availability. However, our results showed that DEXSORB+ has greater treatment capacities for both short- and long-chain PFAS. These results demonstrate that DEXSORB+ has potential as an effective alternative to activated carbon for the removal of a wider range of PFAS in groundwater.

Rapid small-scale column test setup at Cyclopure's laboratory in Skokie, IL.