Performance Evaluation of Amendments for PFAS Sequestration

- **Strategic Fit:** A predominant source of PFAS in sediments is contaminated groundwater discharging from upland source areas, ultimately impacting surface water and posing potential risks to ecological and human receptors. PFAS mass upwelling through and accumulated in sediments can act as a long-term secondary source to surface water even after upland source control is implemented. At many sites, a combination of reactive caps and in-stream treatment may be needed to reduce exposure to sediment receptors (e.g., benthic organisms) and reduce the PFAS load discharging to overlying surface water.
- **Program Goal:** This study will address a critical knowledge gap regarding the effectiveness and longevity of amendments used to sequester PFAS in sediment environments. Specifically, this study aims to generate performance data to evaluate effectiveness of sediment capping for reducing PFAS mass-flux from contaminated sediment to surface water.
- **Value Proposition:** Limited data is available for PFAS sequestration using amendments, which can lead to conservative design, increased costs, and uncertainty in long-term remedy performance. The proposed research will provide practitioners with the data and modeling tools needed to optimize amendment selection and design, thereby reducing both technical and financial risk.
- **Brief Program Description and Expected Deliverables :**
  - Conduct isotherm studies at the Arcadis treatability laboratory to measure partition and kinetics coefficients for various amendments (e.g., FluoroSorb, RemBind, and activated carbon).
  - Determine the effectiveness of amendments in sequestering PFAS mass flux from groundwater and sediment to surface water by conducting isotherm studies coupled with simulating long-term performance using a numerical model (e.g., CapSIM).
  - Evaluate the influence of groundwater upwelling and PFAS mass loading on treatment performance to optimize treatment, by modeling different amendments, layer thickness and configurations, dosing, and contact time.
- **Deliverable(s)**: A work plan outlining study requirements will be submitted prior to initiation. A report documenting the isotherm methodology, test results, modeling results, and recommendations will be provided upon completion.
- **Total estimated budget**: Estimated costs to complete this scope of work are approximately $60,000 ± 50% (excluding the PFAS lab analysis cost). Final cost will be developed with PERF input on the number of amendments and modeling scenarios.