Entries for December 16-31, 2025

Market/Commercialization Information

ANNETTE ISLAND, AK REMEDIAL INVESTIGATION (RI) AND REMEDIAL ACTION (RA) FOR SITE 51 AND 53 (SRCSGT)
U.S. Department of Transportation, Federal Aviation Administration, 697DCK Regional Acquisitions Services, Fort Worth, TX
Contract Opportunities on SAM.gov 697DCK-26-R-00129, 2026

This is a sources sought notice for marketing research purposes only. The Federal Aviation Administration (FAA) seeks responses from SBA-certified 8(a) small disadvantaged businesses with relevant experience to assess the market interest in advance of a future solicitation under NAICS code 562910. Work includes performing remedial investigations and remedial actions at the FAA Storage Yard and Former Housing Area at the former FAA Station on the Annette Island Reserve in Alaska. The work will be conducted in a remote environment under the authority of the Metlakatla Indian Community (MIC). It will require demonstrated experience working with MIC Environmental Council regulations and local permitting requirements. The project includes investigation and remediation of petroleum, lead, PCBs, and asbestos in soil and groundwater; vegetation clearing and excavation; groundwater well installation; waste management; and extensive logistical planning due to limited transportation, communications, and laboratory access. Field activities are anticipated for the Spring/Summer 2026 season. Capability statements are due by 12:00 PM on February 9, 2026.
https://sam.gov/workspace/contract/opp/7e79e2e66fff451fbdba8825a6ff0106/view

CONSTRUCT REPOSITORY COVER TO SUPPORT THE CALLAHAN MINE SUPERFUND SITE IN BROOKSVILLE, MAINE (SOL)
U.S. Army Corps of Engineers, North Atlantic Engineer Division, New England District, Concord, MA
Contract Opportunities on SAM.gov W912WJ26BA008, 2026

This is a total small business set-aside under NAICS code 562910. The U.S. Army Corps of Engineers requires a contractor to construct a repository cover to support the Callahan Mine Superfund Site in Brooksville, Maine. The general scope of work for the proposed contract involves installing a composite cap over an area of ~13 acres. The purpose of the cap is to limit infiltration through mine waste remaining after historical copper mine operations performed on the property. The mine waste consists of rock and rock-amended sediment previously consolidated and graded as part of recent and ongoing Superfund remediation activities. The expected components of the composite cap include (in order from the surface): 12 inches crushed stone (3 minus), geocomposite drainage layer, 60-mil textured geomembrane (seam welded), and geofabric. Other activities to be performed under this contract may include installation of drainage features (e.g., swales, culverts, etc.), grading, seeding and stabilization of disturbed areas outside the stone cover system, stockpile management, and wetland improvements. Offers are due by 1:00 PM EST on March 2, 2026.
https://sam.gov/workspace/contract/opp/a5545aae062343d7a1d7b391dd6a5156/view

FORMALLY UTILIZED SITES REMEDIAL ACTION PROGRAM (FUSRAP) SHALLOW LAND DISPOSAL AREA (SLDA) REMEDIATION PROJECT (SOL)
U.S. Army Corps of Engineers, Great Lakes and Ohio Engineer Division, Buffalo District, Buffalo, NY
Contract Opportunities on SAM.gov W912P426RA003, 2026

This is a full and open competition under NAICS code 562910. The U.S. Army Corps of Engineers, Buffalo District, seeks a contractor for a C-type hybrid contract containing both cost-reimbursable and firm-fixed-price line items to provide remediation services for the Formerly Utilized Sites Remedial Action Program (FUSRAP) Shallow Land Disposal Area (SLDA) Remediation Project. This project addresses environmental remediation needs at the SLDA Site in accordance with the approved Record of Decision and is critical to ensure the safety of site workers, the public, and the surrounding ecosystem. The selected contractor will furnish all labor, equipment, materials, and technical services required to support site mobilization, infrastructure upgrades, excavation and off-site disposal of contaminated soil and debris, operation of on-site laboratories and water treatment systems, environmental and health physics monitoring, confirmation sampling, site restoration, and demobilization, and will provide ongoing technical support to USACE using the established hazardous, toxic, and radioactive waste remedial action work breakdown structure. Offers are due by 1:00 PM EDT on March 13, 2026.
https://sam.gov/workspace/contract/opp/94b65632e8d5413c92f31eff5ab3b1b1/view

LIBBY ASBESTOS SUPERFUND SITE RESPONSIBLE PARTY OVERSIGHT, PROPOSED PLAN, RECORD OF DECISION (SOL)
U.S. Army Corps of Engineers (USACE), Northwestern Engineer Division, Omaha District, NE
Contract Opportunities on SAM.gov W9128F26RA045, 2026

This is a full and open competition under NAICS code 562910. USACE Omaha District seeks a contractor to provide Responsible Party Oversight, oversight of the Feasibility Study (FS) process, and potentially prepare a Proposed Plan (PP) and ROD to document the remedy selection process for OU3 at the Libby Superfund Site in Libby, Montana. Oversight of the FS process will include project management, planning, reporting, and technical support to independently evaluate PRP-led technology screening, alternatives analysis, and overall FS completeness and consistency with the Libby sitewide FS format. Oversight will ensure integration of prior agreements, workshop outcomes, risk management, health and safety requirements, cost estimating, and relevant historical data and interagency inputs. Oversight of the FS process will also encompass coordination and facilitation of an iterative interagency review and comment process, including workshops to resolve comments with EPA and participating agencies. If the option to prepare a PP and ROD is exercised, the work will include documenting remedy selection for OU3 in accordance with EPA guidance. The work will support EPA's CERCLA and NCP public participation requirements, including development of outreach materials, facilitation of public meetings, and preparation of public comment responses and the responsiveness summary. Offers are due by 12:00 PM CST on February 23, 2026. https://sam.gov/workspace/contract/opp/35bd8d4b96e8468e8cb36e617f3d348b/view

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Cleanup News

IN SITU MONITORING OF LNAPL-CONTAMINATED AQUIFER REMEDIATION USING ULTRAVIOLET LIGHT-INDUCED FLUORESCENCE IMAGING
Bewi, R., A. Rodriguez de Castro, and O. Atteia.
Journal of Hazardous Materials 501:140841(2026)

A project proposed and validated an innovative implementation of an in situ monitoring technique for LNAPL remediation treatments, based on ultraviolet light-induced fluorescence imaging (UVIF) combined with automated image post-treatment, to enable in situ and real-time monitoring of decontamination processes. A mini-camera integrated into a set of transparent wells embedded in the subsurface of LNAPL-contaminated zones was used to monitor a surfactant injection remediation process and a skimming operation involving groundwater drawdown. The technique was first calibrated and validated through lab and pilot-scale experiments, then used at a diesel-contaminated site. The pilot test revealed differences of https://www.sciencedirect.com/science/article/pii/S0304389425037628/pdfft?md5=d149b96654aec43eca56fa4b224c9d30&pid=1-s2.0-S0304389425037628-main.pdf

LONG TERM REBOUND AND TRANSPORT OF PERFLUORINATED SULFONIC ACIDS (PFSAS) IN THE VADOSE ZONE FOLLOWING FLUSHING
Schaefer, C.E., G.M. Lavorgna, D.R. Lippincott, S. Hao, J. Conrad Pritchard, and C.P. Higgins.
Journal of Contaminant Hydrology 277:104848(2026)

Increases in PFSA porewater concentrations over 35 months following in situ flushing were monitored at an AFFF site using porous cup suction lysimeters within a highly instrumented test cell. Results provided evidence that PFOS slow desorption kinetics contributed to slow contaminant rebound in measured porewater concentrations. PFSAs in the shallow (0.23 m depth) highly PFSA-impacted soil migrated downward during the monitored post-flushing period, with short-chained PFSAs migrating more rapidly in porewater than long-chained PFSAs. Following flushing, apparent equilibrium porewater concentrations at a depth of 0.61 m bgs were attained within two months for PFPeS, between 2 and 20 months for PFHxS, and 25 months for PFOS. For PFPeS and PFHxS, apparent steady state rebound concentrations (to 38% of their pre-flushing baseline levels, with no increasing or decreasing trend over time subsequently observed) were reasonably predicted based on an equilibrium model. PFOS rebound and ultimately vertical migration were highly impacted by non-equilibrium soil desorption. Excavation of elevated PFSAs in surface soil had no impact on PFSA porewater concentrations 0.38 m below the excavation over a 1.2-year post-excavation monitoring period. Long-term rebound data highlight the potential importance of mass transfer-controlled processes for PFOS leaching, and suggest that removal of elevated PFSAs in surface soil may take years until PFSA discharges to groundwater are diminished.
https://www.sciencedirect.com/science/article/pii/S0169772226000094/pdfft?casa_token=oxaBoTgjcx0AAAAA:FREk8EpVgM1e3UAXWzr32pMgwpfk00pBZg8zufnrp-7AN9RfeQ4p1X4geqbLyKAgXOTHWgkKg&md5=ef0c83bce2c30139de36b9f8c1cd

FLUX BASED STRATEGY FOR PFAS ASSESSMENT AND REMEDIATION
Munsey, K. | Northwest Remediation Conference, 20 October, Tacoma, WA, 25 slides, 2025

This presentation describes a flux-based strategy to assess and remediate PFAS-impacted groundwater, emphasizing how mass flux measurements and targeted in situ treatment can improve remedial effectiveness. The case studies demonstrate the approach at bench and field scales. In a controlled column study, groundwater amended with increasing doses of colloidal activated carbon (CAC) showed progressively greater PFAS removal, confirming CAC's strong sorptive capacity and illustrating how dosage can be optimized to meet site-specific treatment goals. Building on these results, a case study applied flux-based characterization to design and install a permeable reactive barrier at a PFAS-impacted site associated with historical firefighting foam use. Passive flux measurements were used to identify dominant contaminant pathways and inform barrier placement and amendment dosing. Following CAC injection across the barrier, monitoring data indicated substantial reductions in PFAS mass flux and downgradient concentrations, validating both the material selection and the flux-guided design. Collectively, the case studies show that integrating mass-flux characterization with CAC-based in situ remediation provides a practical, scalable framework for controlling PFAS plumes and improving long-term remedial performance. https://pwremediation.com/wp-content/uploads/A3_Munsey.pdf

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Demonstrations / Feasibility Studies

FIRST BIOREACTOR PILOT STUDY OF IN SITU BIOGEOCHEMICAL TRANSFORMATION IN CHINA FOR REMEDIATION OF CHLORINATED ETHENES CONTAMINATED GROUNDWATER AND ITS MICROBIAL INSIGHTS
Ding, W., H. Zhang, X. Ren, and H. Shan.
Journal of Water Process Engineering 81:109228(2026)

In situ biogeochemical transformation (ISBGT), consisting of a reaction pit filled with remedial amendments coupled with recirculation pipelines to increase hydraulic retention time and sustain favorable geochemical conditions, was implemented at a chlorinated ethene- contaminated site. Over 180 days, PCE and TCE declined by 98% with limited cis-DCE and VC accumulation, suggesting near-complete dechlorination. ISBGT operation led to a substantial drop in redox potential (-50 to -420 mV), creating reducing conditions favorable for iron and sulfur cycling. Metagenomic analysis revealed a temporal shift in functional potential, beginning with carbohydrate hydrolysis, followed by enhanced protein fermentation and acetate/H2 generation. Genes associated with redox iron and sulfur cycling, including *mtrCDE* and *pilABC*, increased notably. These processes facilitated the formation of biogenic iron sulfide (Fe-S) minerals, which likely played a central role in the abiotic reduction of PCE and TCE. ISBGT created a geochemically favorable environment where microbial metabolism continuously regenerated reactive Fe-S minerals, enabling sustained and synergistic CVOC degradation under highly reducing conditions.
https://www.sciencedirect.com/science/article/pii/S2214714425023013/pdfft?casa_token=wpwU2h0IXrcAAAAA:Qu8KqKFgvKHKUGRrTdYrHcOAPdtvEtGAbU4pytaXqzt5jyVETjx4rtvs9Qmv4bSWV52VZDcNVg&md5=89678c7dce76cc34ffaf349ea60d54e

FIELD DEPLOYMENT OF FRED-PFAS: A PORTABLE UNIT FOR MEASURING TOTAL PFAS IN THE FIELD
Renaud-Young, M. | RemTech 2025: Remediation Technologies Symposium, 15-17 October, Banff, Alberta, Canada, 22 slides, 2025

The FRED-PFAS onsite screening tool system utilizes a custom polymeric binding system that detects PFAS fluorocarbon chains by producing a high level of fluorescence that decreases in a dose-dependent manner when exposed to PFAS compounds. When combined with a modified SPE process, the system can reach ppt-level detection limits. It was demonstrated on multiple sample matrices, including AFFF rinsates, industrial wastewater, and groundwater. The sensor detects a wide range of PFAS compounds, performing best on analytes with 4 to 12 carbons. Strong signals are seen with EPA-8 analytes such as PFOA and PFOS. The sensor was tested on a wide variety of potential interferences, showing strong selectivity, and found some issues with high ppm metals and detergent concentrations. The presentation highlights the technical system validation, including an in-field pilot conducted at an AFFF facility where the system was compared to third-party analytical lab data. Strong correlation of system results to analytical methods was seen across samples. Performance data includes correlation data against methods such as EPA 1633 and TOF ($R^2 > 0.9$). Case study results are presented that demonstrate the benefits of implementing onsite PFAS monitoring in an investigation/remedial application, with a focus on increased operational efficiency and projected long-term value for implementing such a monitoring system.
Slides: https://esaa.org/wp-content/uploads/2025/10/MARGARET-RENAUD-YOUNG.pdf
Longer abstract: https://esaa.org/wp-content/uploads/2025/09/RT2025-program-Abstracts_20_pdf

LEVERAGING TEMPORAL CSIA GROUNDWATER DATA AND AUTOMATED WORKFLOWS TO EVALUATE DEGRADATION BEHAVIOR AT DNAPL SITES
Cheyne, C., J. Konzuk, L. D'Agostino, K. Kim, J. Stening, O. Bukhteeva, and B. Goodwin.
Groundwater Monitoring & Remediation 45(4):51-73(2025)

A methodology is presented to evaluate natural and enhanced degradation behavior at complex DNAPL sites using automated processing of CSIA groundwater datasets developed over several years of sampling. The method utilized CSIA datasets from the Orica Botany Bay Facility in Matraville and a former chemical manufacturing facility in Victoria to gain qualitative and semi-quantitative insights into natural and enhanced attenuation processes. An automated workflow was developed to evaluate CSIA data trends to assess degradation mechanisms and rates, providing insight into contaminant attenuation progress across large, complex sites. Isotopic enrichment factors were estimated based on temporal groundwater concentration and CSIA data at individual well locations. The enrichment factors were evaluated alongside corresponding geological, microbial, and geochemical data to identify areas where attenuation plays a significant role in contaminant mass reduction. Interpreting the CSIA data was verified by comparing to enrichment factors in literature, assessing other evidence supporting degradation activity, and considering aspects of the site conceptual model that could affect isotopic behavior. By applying an automated workflow to CSIA datasets, findings demonstrate a valuable standardized approach to gain useful knowledge on the contribution of monitored natural attenuation and enhanced biodegradation to contaminant mass reduction at complex sites. The study also illustrates some complexities associated with DNAPL sites that should be considered when interpreting CSIA data.

A RESEARCH NOTE ON MIXED ORGANOCHLORINE PESTICIDE DEGRADATION: DDT AND ENDOSULPHAN IN COMPOST-AMENDED AEROBIC AND CYCLIC TREATMENTS
Guerin, T.F. | Remediation 36(1):e70049(2025)

A rapid assessment pilot study evaluated the efficacy of low-cost, biologically based remediation strategies for organochlorine pesticide (OCP)-contaminated soil at a former agrochemical facility in regional New South Wales. Five treatment configurations were tested over 12 weeks, varying in compost amendment and aeration regimes, including cyclic aeration with and without compost, aerobic composting, passive aerobic treatment, and an abiotic control. Non-composted treatments with cyclic or passive aeration achieved the most substantial reductions in DDT concentrations, with decreases of up to 67%. Compost-amended treatments exhibited enhanced microbial activity but did not result in greater contaminant degradation. The study also documented co-occurring endosulfan, which showed partial reduction in several treatments despite low initial concentrations, highlighting the potential of simple, scalable bioremediation systems to address mixed OCP contamination. Limitations such as small-scale pile sizes, composite sampling, and short treatment duration may have influenced the outcomes. Future research should focus on longer-term trials, stratified sampling, and detailed microbial and metabolite analyses to optimize strategies for dual-contaminant remediation.

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Research

PARABURKHOLDERIA XENOVORANS STRAIN LB400 SIGNIFICANTLY DECREASED VOLATILIZATION OF POLYCHLORINATED BIPHENYLS (PCBS) FROM FRESHWATER AND SALINE SEDIMENTS
Ramotowski, D.J., A. Martinez, R.F. Marek, K.C. Hornbuckle, T.E., and Mattes.
ACS ES&T Water 5(10):5841-5851(2025)

The potential to decrease the emissions of lower-chlorinated (LC)-PCBs (Paraburkholderia xenovorans strain LB400 in lab microcosms using historically PCB-contaminated sediments from a wastewater lagoon (Altavista, VA [AVL]) and an estuary (New Bedford Harbor, MA [NBH]). The impact of non-shaken vs shaken conditions was compared to airborne PCBs in LB400-bioaugmented AVL sediment (51% LC-PCBs) to better replicate field conditions. After 35 days, airborne LC-PCBs decreased by 54% in non-shaken bioaugmented AVL sediments, compared to a 60% decrease in shaken bioaugmented sediments. Bioaugmenting LB400 into unshaken NBH sediments (44% LC-PCBs) significantly decreased airborne LC-PCBs by 50% over 35 days. Biphenyl dioxygenase gene abundance decreased by several orders of magnitude after 16 days in all experiments, demonstrating a potential decrease in treatment effectiveness over time. Findings demonstrate that LB400 effectively degrades LC-PCBs with varying profiles over a range of environmentally relevant mixing scenarios. Further treatment delivery development has the potential to protect nearby communities from PCB exposure, decrease health risks, and improve quality of life.

SPATIALLY RESOLVED SOURCE APPORTIONMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) WITHIN A POST-INDUSTRIAL RIVER CATCHMENT
Byrne, P., W.M. Mayes, A.L. James, S. Comber, E. Biles, A.L. Riley, P.L. Verplanck, and L. Bradley. I Science of The Total Environment 1001:180502(2025)

A river catchment-scale approach was used to identify PFAS source zones and assess the relative importance of industrial PFAS sources in the River Mersey, UK, a post-industrial, densely populated catchment with diverse PFAS sources. Synoptic sampling and PFAS river load analysis identified key sub-catchments and river stretches contributing the majority of PFAS. The highest PFAS concentrations did not always correspond to the greatest loads. Most PFOS (64%), PFOA (49%), 6:2FTS (46%), and PFHxS (56%) were exported from the Upper Mersey sub-catchment, despite higher concentrations in northern sub-catchments, emphasizing the importance of load-based monitoring. Mass balance analysis of loads highlighted substantial inputs from specific river stretches, notably the Lower Irwell, River Tame, and Upper Mersey. While PFAS loads generally scaled with catchment area, yield (load/unit area) analysis identified disproportionately high exports from small headwater catchments, notably the upper River Roch (PFOA, PFHpA, and PFHxA) and Glaze Brook (PFBS). Industrial sources in the sub-catchments were confirmed using gadolinium anomaly analysis and consented discharge records. Gadolinium data suggested industrial discharges may contribute to PFAS occurrence at 62% of sample sites throughout the catchment. Findings demonstrate that spatial analysis of PFAS loads, rather than concentrations alone, is critical for identifying PFAS source areas.

QUANTIFICATION OF DEGRADATION RATE CONSTANTS IN AQUIFER MATERIALS USING CARBON-14 CHLORINATED ETHENES

Freedman, D.L., A. Rivera-Cruz, O.D. Groshans, and J.T. Wilson.
Groundwater Monitoring & Remediation 45(4):101-112(2025)

A study evaluated the use of ^{14}C assay to measure the rate constants for the degradation of chlorinated ethenes in contaminated aquifers using soil and groundwater samples from three sites. Use of ^{14}C-labeled compounds makes it possible to quantify degradation by measuring the accumulation of degradation products that are otherwise difficult to discern from background levels ($^{14}CO_2$ and ^{14}C-labeled soluble compounds). The soil and groundwater samples were added to serum bottles; one set of the microcosms was incubated in the absence of oxygen, and another set in the presence of oxygen. After injecting purified ^{14}C -PCE, ^{14}C -TCE, or ^{14}C-cDCE, unlabeled compounds were added to bring the initial concentrations to ~200-1,700 µg/L. The microcosms were placed on a tumbling device to ensure gentle agitation during incubation. At weekly intervals over 42 days, 5 mL liquid samples were withdrawn, filtered, and sparged to remove the unreacted 14C-labeled parent compound. The amounts of ^{14}C products that accumulated were used to calculate pseudo-first-order rate constants that ranged from 0.0092 to 0.24/year. https://ngwa.onlinelibrary.wiley.com/doi/epdf/10.1111/gwmr.70021

INCINERATION OF PERFLUOROOCTANOIC ACID LEADS TO REGENERATION OF SMALLER PERFLUOROCARBOXYLIC ACIDS
Rocchio, C., J. Mattila, S. Sharma, J. Krug, G. Kogekar, W. Roberson, J. Offenberg, K. Pennell, W. Linak, and C. Goldsmith.
The Journal of Physical Chemistry A 129(35):8160-8169(2025)

A study demonstrated that PFOA destruction in a pilot-scale incinerator led to a mixture of smaller PFCAs. Chemical ionization mass spectrometry was used to measure the concentration of PFCAs ranging from C_2 to C_9. The actual yield of PFCAs depends upon the location of PFOA injection and thus upon the peak temperature experienced within the furnace. A chemical kinetic mechanism was developed to explain the results. Two different pathways were considered: a low-temperature pathway that proceeds through a short-lived α-lactone intermediate and a high-temperature pathway that proceeds through cleaving a C-C bond in the alkyl backbone. Theoretical modeling of PFOA incineration at peak temperatures of ~1130 and ~1020 K predicted the formation of trifluoroacetic acid and other small PFCAs.

IN SITU SURFACTANT-ASSISTED ASSEMBLY FOR EFFICIENT REMOVAL OF PFAS BY LOW-PRESSURE ULTRAFILTRATION MEMBRANE PROCESS
Ren, Z., Z. Feng, H. Liang, Z. Zhu, Y. Yang, and X. Lu.
Environmental Science & Technology 60(2):2207-2218(2026)

A surfactant-assisted ultrafiltration (UF) strategy is presented for enhanced PFAS separation through leveraging in situ assembly of PFAS molecules with the cationic surfactant cetyltrimethylammonium bromide (CTAB). Adding CTAB (0.14 mM) induces the formation of nanoscale complexes or micelles with PFAS, promoting effective retention by UF membranes (99.1% for 0.14 mM CTAB vs 30.3% without CTAB). Experimental and modeling results reveal a concentration polarization effect that leads to the accumulation of CTAB on the membrane surface. Even when the bulk concentration of CTAB is below its critical micelle concentration, localized micelle formation occurs near the membrane interface, enabling effective retention of PFAS. Notably, the CTAB-enhanced UF process is also effective in retaining other PFAS species, especially long-chain compounds such as PFHxA. Further experiments indicate that compared with electrostatic interactions, hydrophobic interactions between PFOA and CTAB play a more dominant role in forming micelles, thereby governing the subsequent retention by UF membranes. The study offers mechanistic insights into surfactant-mediated PFAS removal and presents a scalable, low-pressure membrane strategy for the effective treatment of PFAS-contaminated water.

SURFACE-ENHANCED RAMAN SPECTROSCOPY DETECTION OF PER- AND POLYFLUOROALKYL SUBSTANCES IN AQUEOUS FILM-FORMING FOAMS
Wang, C., K. Biswas, S. Jeong, A. Bello, D. Bello, and M.B. Ross.
Environmental Science & Technology 60(1):1153-1160(2025)

Concave cubic gold nanoparticles were used for surface-enhanced Raman spectroscopy (SERS) to detect PFAS in ppm concentrations, differentiating the six PFAS (PFHpA, PFNA, PFDA, PFOA, PFHxS, and PFOS) regulated by the Massachusetts Department of Environmental Protection. Calculated Raman spectra, solid-state Raman spectra, and ^{19}F NMR are used to further understand the physicochemical properties of these six PFAS. Quantitative analysis of PFOA and PFOS can be achieved from 0.1 to 10 ppm, while PFAS can be differentiated from three common fluorinated pharmaceuticals, and PFCA can be differentiated from C_7 to C_{10} based on the length of the perfluoroalkyl backbone. The study highlights that SERS can be used to identify PFAS in real-world AFFFs, as confirmed separately by mass spectrometry.

EVALUATION OF THE BIOLOGICAL TREATMENT OF A REAL CONTAMINATED GROUNDWATER THROUGH REDUCTIVE DECHLORINATION BIOSTIMULATION
Yaqoubi, H., H. Yaqoubi, G. Sassetto, M. Presutti, M. Belfaquir, B. Matturro, S. Rossetti, L. Lorini, M.P. Papini, and M. Zeppilli. Frontiers in Chemical Engineering 7:1511251(2025)

A microcosm study assessed the effectiveness of bioaugmentation with an enriched dechlorinating consortium to remediate tetrachloroethane (TeCA), TCE, and sulphate ion in groundwater. Various conditions, including biostimulation and bioaugmentation approaches, were tested to evaluate the feasibility of biological treatment. Operating conditions facilitated the dechlorination of TCE into ETH, leading to an increase in the *Dehalococcoides mccartyi* population to 67% of the total bacteria, with reductive dechlorination (RD) rates up to 7 µeq/Ld. The RD performance of microcosms with real contaminated groundwater was negatively affected by the combined presence of TeCA and sulphate, indicated by a low abundance of *D. mccartyi* (D. mccartyi were associated with higher reductive dechlorination rates, while non-augmented and non-stimulated microcosms reflected distinct microbial communities dominated by non-dechlorinating taxa. In addition, RD decreased (48, 23, 22, and 14 µeq/Ld) with increasing sulphate concentrations (0, 150, 225, and 450 mgSO_4 -2/L), further demonstrating the inhibitory effect of sulphate in the treated contaminated groundwater. *This article is* ***Open Access*** *at* https://www.frontiersin.org/journals/chemical-engineering/articles/10.3389/fceng.2025.1511251/full

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General News

PORTABLE ELECTROCHEMICAL SENSORS FOR PER- AND POLYFLUOROALKYL SUBSTANCES: DESIGN, CHALLENGES, AND OPPORTUNITIES FOR FIELD DEPLOYMENT
Gondhiya, N., A. Ur Rehman, D. Andreescu, and S. Andreescu.
Current Opinion in Electrochemistry 53:101725(2025)

Electrochemical sensors provide the necessary sensitivity to detect PFAS at regulatory limits and show promise for large-scale environmental monitoring without requiring costly lab equipment. This review highlights recent advances in electrochemical sensing technologies and their potential as field-deployable devices for rapid screening and onsite PFAS detection. Examples include sensor platforms based on redox-active reporters, molecularly imprinted polymers, redox dyes, metal organic frameworks, covalent organic frameworks, nanoparticle impacts, and nanobubble and nanopore technologies, coupled with direct or indirect signal transduction strategies. The review also discusses promising sensor designs and detection mechanisms and outlines the key challenges and future directions needed to advance their practical deployment in environmental monitoring applications.
https://www.sciencedirect.com/science/article/pii/S2451910325000845/pdfft?md5=012a7d440987b64e14d6d185d4796lfe&pid=1-s2.0-S2451910325000845-main.pdf

COVALENT ORGANIC FRAMEWORKS FOR ADSORPTION OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)
Zhang, G., Y. Li, X.-A. Wang, J. Lin, Y. Cao, Z. Jia, and S. Liu.
ACS Applied Polymer Materials [Published online 26 January 2026 before print]

This review systematically summarizes how covalent organic frameworks (COF) structural modifications, specifically functional group engineering and pore optimization, regulate PFAS adsorption mechanisms via electrostatic, hydrophobic, and fluorine-fluorine interactions. To address challenges, including high synthesis costs of COFs and insufficient adsorption efficiency toward short-chain PFAS, the review also outlines future research priorities. Thus, this work not only provides theoretical guidance for designing high-performance COF-based adsorbents but also supplies ideas and methods for the control of PFAS.

BIOREMEDIATION OF POLYCYCLIC AROMATIC HYDROCARBONS CONTAMINATED SOILS/WATER FOR ENVIRONMENTAL REMEDIATION
Sahith, V.N., J. Aravind Kumar, V.S. Sruthi, S. Sundararaman, D. Prabu, D. Venkatesan, and A.A. Renita. | Biodegradation 37(3)(2025)

This review focuses on the biodegradation of various PAHs, such as naphthalene, phenanthrene, anthracene, and pyrene, by bacteria, including *Pseudomonas*, *Mycobacterium, Rhodococcus*, and marine species from the *Novosphingobium* genus. These microbes use dioxygenase enzymes to initiate the breakdown of PAHs into less toxic intermediates. The review also explores the role of biosurfactants and biofilms in enhancing the bioavailability of PAHs, promoting more efficient degradation. It also discusses the advantages of microbial consortia, where multiple species collaborate to degrade a broader range of PAHs. Recent advancements in genetic engineering, synthetic biology, and nanotechnology are highlighted as promising tools to further enhance microbial degradation efficiency. The microbial bioremediation represents a sustainable solution to PAHs contamination, complementing traditional methods and offering significant potential for environmental restoration and human health improvement.

ESTIMATING ACCURACY AND PRECISION IN THE BIOAVAILABILITY-ADJUSTED EXPOSURE POINT CONCENTRATION TO SUPPORT HUMAN HEALTH RISK ASSESSMENT OF LEAD-CONTAMINATED SOILS
Nelson, C., K. Li, G. Diamond, M. Lambert, and K. Bradham.
Journal of Toxicology and Environmental Health - Part A 89(2):79-93(2026)

Under EPA's CERCLA program, soil suspected of lead (Pb) contamination is evaluated to assess the impact of soil Pb exposure on blood Pb levels. The decision to remediate partly relies on whether the measured soil exposure point concentration (EPC) exceeds an action level. EPA established data quality objectives (DQOs) to support data collection used to estimate the EPC and assess confidence in remediation decisions. To support DQO processes at sites where site-specific soil Pb relative bioavailability (RBA) is assessed, a statistical simulation model was developed that estimates false compliance/exceedance decision error probabilities based upon uncertainty in the RBA-adjusted EPC, employing model inputs defining the sampling protocol being evaluated, variability in total and bioavailable soil Pb across the assessed area, and analytical measurement uncertainty. A framework for utilizing the simulation model is presented using a hypothetical site informed by concentration and soil Pb bioavailability distributions from an actual Pb-contaminated site. Pre-sampling, false compliance/exceedance decision error probabilities were predicted for various sampling protocols. A DQO-compliant sampling protocol was then selected, and accuracy and precision in the measured EPC were assessed relative to a specified risk-based action level.

RECENT PROGRESS IN CURRENT AND EMERGING TECHNIQUES FOR THE DETECTION OF PFAS – THE FOREVER CHEMICALS
Chugh, V., P. Gaskin, and W. Zhang. Sensors & Diagnostics (2026)

This review surveyed PFAS sensor technologies developed in the past decade, including optical, electrochemical, and emerging biosensing and whole-cell reporter platforms. For each sensor class, typical limits of detection, dynamic ranges, regeneration, and compatibility with repeated measurements in real and complex water matrices are summarized. The underlying recognition and transduction principles, including molecularly imprinted polymers, host-guest interactions, ion-selective membranes, nanomaterial-enhanced interfaces, and biological recognition elements, are highlighted to connect materials design with analytical performance. Across the platforms, key advantages include miniaturization, rapid response, and potential integration into portable or online monitoring systems. Major limitations involve selectivity among structurally similar PFAS, matrix interferences, long-term stability, and limited multi-analyte capability. The review discusses how current research addresses these challenges through preconcentration strategies, sensor arrays, nanostructured materials, and integrated sample handling and outlines future directions toward regulatory-grade, field-deployable PFAS sensors capable of continuous monitoring, multiplex detection, and scalable deployment in drinking water and environmental surveillance. https://pubs.rsc.org/en/content/articlepdf/2026/sd/d5sd00166b

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