Entries for September 1-15, 2025

Market/Commercialization Information

STANDARD CHLORINE OF DELAWARE- REMEDIATION SERVICES SINGLE AWARD TASK ORDER CONTRACT (SATOC) (SOL)
U.S. Army Corps of Engineers(USACE), Engineer Division North Atlantic, Philadelphia District, Philadelphia, PA
Contract Opportunities on SAM.gov W912BU25RA015, 2025

This is a total small business set-aside under NAICS code 562910. The USACE Philadelphia District, requires a contractor to provide various Environmental Remediation Action Services at Operable Unit 2 of the Standard Chlorine of Delaware Superfund site. The contractor will be responsible for all remediation work required under the contract, including sampling, analyses, demolition, excavation, backfilling, handling, packaging, remediation using low temperature thermal desorption (LTTD) and, if necessary, transportation and disposal of materials. The upper 2 ft of treated sediment will be amended with compost or organic-rich topsoil, bio-augmented GAC, microbes, and other biological amendments to create a bioreactive zone that supports vegetation and enhances bioaugmentation in the event of continued contaminated groundwater discharge to the wetland. Wetland restoration will include revegetation with native species and long-term monitoring. The contractor will also provide design support, collaborating with the EPA and its design consultant to complete the remedial action design. The award will be a Single Award Task Order Contract with an ordering period of five years. Each task order may include firm-fixed-price and cost-plus-fixed-fee scope items as appropriate. Offers are due by 6:00 PM EDT on October 29, 2025.
https://sam.gov/workspace/contract/opp/da6bab2b59da4a62b20d4fe2b7e1e1f/view

LICENSE SITE REMEDIATION PROFESSIONAL SERVICES (COMBINE)
U.S. Department of Energy, Princeton Lab - DOE Contractor, Princeton, NJ
Contract Opportunities on SAM.gov 25-062R, 2025

This is a full and open competition under NAICS code 562910. The Princeton Plasma Physics Laboratory, a Department of Energy Contractor, requires the services of a Licensed Site Remediation Professional. Task 1 involves preparing and submitting various reports, certifications, and administrative documents to NJDEP, including the Biennial Remedial Action and Aquifer CEA Certification with the required well search and supporting documentation. It also covers accurate and complete preparation of other regulatory submittals, which may include the Confirmed Discharge Notification, LSRP Retention Form, Annual Remediation Fee Form, Public Notification Form, Remedial Investigation Report/Remedial Action Workplan, Quality Assurance Project Plan, Alternative Remediation Standards application, Remedial Action Report, and Unrestricted Use Response Action Outcome, among others. A minimum of ten working days will be provided for PPPL and/or DOE review and comment on scheduled submittals. The cost of this scope assumes one site visit, for which a Job Hazard Analysis will be prepared and a pre-job brief conducted prior to the start of work, as needed. Task 2 includes investigation and remediation of soil impacts from spill and legacy impacts. Work involves advising, providing technical support, evaluating data and a selection of samples for contingent analysis, and conducting investigations of soil impacts from spills and legacy impacts. Work also may include, if requested by PPPL, a written summary of the remediation and analytical results, with recommendations for supplemental cleanup, if necessary; and any LSRP-required work products to validate and certify the effectiveness of remediation done by PPPL in response to spills or legacy contamination. The award will be a five-year Basic Ordering Agreement. Interested parties must participate in the mandatory pre-proposal zoom conference. Offers are due by 4:00 PM EDT on November 6, 2025. https://sam.gov/workspace/contract/opp/7a6e02a6a2ab4d6686736c7523f64fd/view

ARCHITECT-ENGINEER SERVICES FOR COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY (CLEAN VII) FOR NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND PACIFIC (PRESOL)
Department of the Navy, Naval Facilities Engineering Systems Pacific Command, Joint Base Pearl Harbor-Hickam, HI
Contract Opportunities on SAM.gov N62742-25-R-1800, 2025

This is an invitation for qualified firms interested in this future procurement under NAICS code 541330 to submit Standard Form 330. This future procurement will establish a Comprehensive Long-Term Environmental Action, Navy contract to provide environmental technical and engineering services for NAVFAC Pacific, with a primary focus on cleanup and restoration of contaminated sites under CERCLA. Key activities include evaluating site conditions, conducting field investigations, sampling and analyzing environmental media, validating data, and performing risk assessments. The contractor will also support remedial planning and design, oversee cleanup construction, and prepare reports such as Preliminary Assessment/Site Inspection, Remedial Investigation/Feasibility Study, Remedial Design, and Remedial Action Completion Report. Additional work may involve addressing emerging contaminants, investigating munitions and explosives of concern, and assessing sites with radioactive materials, as well as supporting compliance with Federal and DoD environmental and safety regulations. Work will occur on military property within the NAVFAC Pacific area of responsibility, often in locations with complex site conditions such as terrestrial, subsurface, marine, and coastal environments, and may involve multiple media of concern including soil, groundwater, sediment, surface water, and air. Access to these sites is restricted to U.S. citizens or qualified personnel. Standard form 330s are due by 8:00 PM EDT on October 30, 2025https://sam.gov/workspace/contract/opp/8be1d5bef0f24?ffb82b7f032d54002b/view

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Cleanup News

INCREASING DENSITY AND VISCOSITY OF LIGHT NON-AQUEOUS PHASE LIQUIDS ARE INDICATORS OF NATURAL SOURCE ZONE DEPLETION
Smith, J.W.N., E. Hinojosa, and A.F.M. Hill.
Quarterly Journal of Engineering Geology and Hydrogeology 58(1):qjegh2024-104(2025)

This paper presents data on LNAPL density and viscosity and shows changes that result from natural source zone depletion (NSZD) processes. Increasing trends in LNAPL density and viscosity were observed, providing a qualitative line of evidence for NSZD. When LNAPL density and viscosity were combined with contemporaneous LNAPL chemistry analysis it was possible to correlate changes in the physical properties to depletion of alkanes from the LNAPL in a manner that would inform a quantitative NSZD assessment. In addition, LNAPL density and viscosity measurements are relatively inexpensive and reproducible. https://www.lyellcollection.org/doi/epub/10.1144/qjegh2024-104

FULL-SCALE APPLICATION OF IN SITU BIOREMEDIATION WITH HARDWOOD MULCH BIOBORINGS AS A SUSTAINABLE, NATURE-BASED APPROACH FOR REDUCTIVE DECHLORINATION
Masut, E., L. Ferioli, K. Morris, A. Legnani, and C. Righetto.
AquaConSoil 2025, 16-20 June, Lieve, Belgium, abstract only, 2025

Full-scale in situ bioremediation involved applying hardwood mulch as an electron donor for enhanced reductive dechlorination at a chlorinated ethenes-contaminated site in northern Italy. After operating a P&T system near the downgradient site boundary as hydraulic containment, alternative in situ bioremediation options were assessed to treat both the contamination source and mitigate downgradient migration of the plume. A bench-scale study and a field pilot test were conducted to provide proof of concept that the application of hardwood mulch with a "bioboring" configuration in the subsoil, together with a commercial bioaugmentation inoculum, could support the complete anaerobic reductive dichlorination of contaminants (mostly TCE and 1,2-DCE) to ethene. However, due to the high initial concentrations in the pilot test area, the extent of the biological reductive process triggered by the tested amendment was limited. A full-scale application was designed and implemented, which involved the installation of additional mulch bioborings, grouped into transects aligned perpendicular to the main groundwater flow, and the addition of a commercial emulsified vegetable oil-based product in the amendment mixture in the most critical contaminated areas. Microbiological and chemical groundwater monitoring was conducted before the start and after the completion of the bioboring installation activities. Groundwater monitoring results after installation provided proof of concept with multiple lines of evidence that complete in situ anaerobic reductive dechlorination of TCE to ethene can be achieved in the aquifer with the use of a hybrid in situ bioremediation strategy. Additional monitoring data are considered necessary to define the long-term effectiveness of the tested technology in the full-scale configuration. Results confirm that a sustainable and nature-based carbon source amendment can be a valid aid for in situ remediation of contamination sources and plumes of chlorinated aliphatic compounds in groundwater, and it may help lower the project life-cycle of conventional and energy-intensive plume management measures such as P&T systems. *See poster from 2024 Battelle Chlorinated conference*https://xcdcademy.s3.amazonaws.com/battelle/2024_Chlorinated/H4_352_Poster_Masut.pdf

SUSTAINABLE REMEDIATION - STRATEGY, BEST PRACTICES, AND REAL WORLD APPLICATIONS
Fleri, M.A. | Sustainable Remediation Forum (SURF) webinar, 1 May, 42 minutes, 2025

This presentation provided a perspective on integrating sustainability principles into remediation projects, focusing on best practices, innovative strategies, and key data collection methods that drive responsible decision-making. It explored how sustainability is applied in real-world scenarios through project case studies, highlighting successful project execution, waste minimization, resource optimization, recycling, and carbon footprint accounting. https://www.youtube.com/watch?v=J9mK-ZegDXc

TAILORED MULTI-STAGE REMEDIATION TO ADDRESS PFAS CHALLENGES AT A COMMERCIAL AIRPORT
Bani, B. | PFAS Forum V, 9-11 April, Orlando, FL, 32 minutes, 2025

An innovative remediation strategy and an adaptable management framework were developed to address PFAS contamination in groundwater and soil under diverse hydrogeological and climatic conditions at a commercial airport in Canada. The project developed a comprehensive PFAS management program encompassing site characterization, source identification, risk assessment, remedial investigation, treatment evaluation, and interim remedial actions, such as hotspot source removal. A site-specific risk assessment was conducted using innovative read-across new approach methods to assess risk of PFAS parameters without regulatory toxicity values. Findings informed the establishment of site-specific risk-based criteria to guide remediation, reducing reliance on evolving generic regulatory standards. A dynamic and data-driven approach integrated hydrogeological modeling, a visual 3D CSM, and stakeholder engagement to inform decision-making. A multi-stage remediation approach expedited remedial efforts by targeting PFAS mass removal and soil stabilization in critical hotspot areas and stabilizing PFAS groundwater plume migration at the site boundary while concurrently conducting risk assessments. The approach relied on data-driven modeling using 3D Earth Volumetrics Studio to strategically target bulk PFAS mass in soil and shallow groundwater for maximum removal efficiency. Early results demonstrated the potential of a dynamic and data-driven approach to reduce PFAS mass in soil by up to 80%, while significantly mitigating PFAS migration in shallow groundwater to a downgradient offsite receptor. Key lessons highlight the importance of integrating high-resolution site characterization techniques, advanced analytical methods, and hydrogeological modeling to understand PFAS fate and transport, enabling targeted and efficient dynamic remediation efforts. The work underscores the importance of adaptive, data-driven approaches to PFAS management, providing a roadmap for navigating the challenges of a dynamic regulatory landscape while addressing stakeholder concerns and environmental risks.
https://www.youtube.com/watch?v=g1nvF7vZ0hs&list=PLYW8x4mFadkvXQ-fPPXaadpBU5Sv_Wvs8&index=6

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Demonstrations / Feasibility Studies

DESTRUCTION OF PFAS DURING THERMAL REACTIVATION OF GRANULAR ACTIVATED CARBON USED IN POTABLE WATER TREATMENT
Mayerberger, E., A. Rodriguez, E. Townsend, R. DiStefano, R. Alward, and J. Matthis.
Remediation 35(4);e70030(2025)

Several studies have shown that thermal reactivation of GAC can destroy PFAS. The present work addresses remaining knowledge gaps for full-scale potable reactivation facilities. Two separate reactivation trials of PFAS-laden spent GAC were performed at a full-scale potable-classed reactivation facility employing two rotary kiln furnaces and an off-gas abatement system. Three main objectives were to (1) determine the PFAS destruction removal efficiency; (2) demonstrate the current production rates and kiln operating conditions to remove PFAS below detectable limits on reactivated GAC; and (3) incorporate state-of-the-art capture and EPA analytical methods for vapor phase PFAS and products of incomplete combustion or destruction analysis. Each reactivation trial consisted of 3 independent reactivation tests, for a total of 6 data sets. The 2024 Trial utilized the revised OTM-45 method, and the 2023 Trial utilized the original OTM-45 method. At the temperatures and operating conditions tested, no targeted PFAS were detected on the reactivated GAC, and > 99.9% PFAS destruction removal efficiency was achieved through the reactivation process. All individual compound emissions were found to exist at levels significantly below the current and proposed state regulatory values. OTM-50 and EPA Method 0010/8270 yielded non-detect results at the sample collection points for each temperature and operating condition evaluated. Results demonstrate and support GAC reactivation as a viable method for the destruction of PFAS, thus breaking the cycle within the environment.
https://onlinelibrary.wiley.com/doi/epdf/10.1002/rem.70030

PHYTOREMEDIATION OF TOTAL PETROLEUM HYDROCARBONS-CONTAMINATED SOILS: CASE STUDY OF JERUSALEM ARTICHOKES WITH COST ANALYSIS AND BIOMASS CONVERSION
Rubezius, M., Z. Kidikas, C. Kick, and A. Kasiuliene. | Agronomy 15(3):601(2025)

A full-scale phytoremediation experiment was conducted at a former oil storage site using energy crops like Jerusalem artichokes (*Helianthus tuberosus*), where the biomass was later converted into biofuel and other by-products using lab-scale technology. Significant and promising results included: within two years, the initial total petroleum hydrocarbons contamination level (698 mg/kg) was reduced to a permissible level (146 mg/kg); the yield of the harvested Jerusalem artichoke biomass reached 18.3 t/ha dry weight; the thermochemical conversion produced high-quality products, such as a thermally stable oil a higher heating value (HHV) of 33.85 MJ/kg; and the two-year phytoremediation costs for the rejuvenated soil amounted to 3.75 EUR/t.*This article is* ***Open Access*** *at*
https://www.mdpi.com/2073-4395/15/3/601

ADAPTATION AND CARBON REDUCTION FOR PETROLEUM CONTAMINATED SOIL REMEDIATION IN RESPONSE TO CLIMATE CHANGE-A CASE STUDY OF PHYTOREMEDIATION COMBINED WITH BIOCHAR
Cheng, P.-C., M.-S. Lin, C.-Y. Huang, S.-F. Cheng, and Y.-C. Lin.
Journal of Environmental Management 393:126956(2025)

A field trial was conducted to evaluate the combined effects of biochar amendment (2.5 %) and vetiver planting on total petroleum hydrocarbon (TPH) degradation efficiency and CO_2e mitigation in both freshly contaminated and weathered soil. Results demonstrated that biochar application enhanced vetiver plant biomass by ~1.6-fold in both soil types. After six months, TPH removal efficiencies reached nearly 90% in biochar-amended soils planted with vetiver. The estimated carbon reduction potential reached approximately 440.7 tons CO_2e per hectare in freshly contaminated soil and 482.4 tons CO_2e per hectare in weathered soil, highlighting the dual benefits of contaminant remediation and climate change mitigation.

IN SITU JET GROUTING-ASSISTED CHEMICAL OXIDATION FOR REMEDIATION OF POLYCYCLIC AROMATIC HYDROCARBON-CONTAMINATED SITES: AN ENGINEERING PRACTICE
Sang, K., X. Wu, B. Li, and C. Ke. Journal of Environmental Engineering 151:9(2025)

Prior to in situ jet grouting-assisted chemical oxidation treatment, a comprehensive investigation, including sampling, chemical analysis, and geographical statistical analysis, was conducted to describe the content and spatial distribution characteristics of PAHs at an abandoned coking site in Hunan province, China. Lab and field tests were carried out to determine the optimal proportion of the compound oxidant and the optimal parameters of jet grouting before pilot-scale application to verify the effectiveness of the remediation technology. Results indicated that six PAHs exceeded the filter values, and the spatial distribution showed "patchy aggregation" characteristics. In addition, the low-ring PAHs first increased and then decreased with depth, with a maximum polluted depth of 6.0 m, while the high-ring PAHs decreased with depth, with a maximum polluted depth of 3.0 m. Low-ring PAHs were the primary contaminant, with leakage of oil by-products, including tar residue, naphthalene oil, and acenaphthene being the main reason for site contamination. The intrinsic properties of PAHs and geological structures in the coking site were important influencing factors. The optimal parameters of remediation technology were a compound oxidant proportion of 5%, an injection pressure of 25 MPa, a rotation speed of 15 r/min, a lifting speed of 15 cm/min, and a nozzle diameter of 2.5 mm. https://ascelibrary.org/doi/epdf/10.1061/JOEEDU.EEENG-8081

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Research

REGENERATION OF CONVENTIONAL AND EMERGING PFAS-SELECTIVE ANION EXCHANGE RESINS USED TO TREAT PFAS-CONTAMINATED WATERS
Ellis, A.C., T.H. Boyer, and T.J. Strathmann.
Separation and Purification Technology 355(Part B):129789(2025)

The efficacy of various regenerant solution constituents, mixtures, and operational considerations was evaluated to regenerate both 'regenerable' and 'PFAS-selective' anion exchange resins (AERs) loaded during a pilot treatment study of PFAS-contaminated groundwater. Batch screening of regenerant solution constituents found that both resin classes may be effectively regenerated by combining salt brine and organic cosolvent, though high cosolvent fractions are necessary for PFAS-selective AERs. While neither brine-only nor solvent-only regenerant solutions effectively desorbed PFAS, regeneration efficacy with brine/cosolvent mixtures varied with salt type and cosolvent composition. Chloride salts outperformed sulfate and bicarbonate salts; cosolvent efficacy depended on the volume fraction and type used, and highly non-polar solutions led to optimal PFAS desorption. Continuous-flow regeneration experiments showed near-complete PFAS desorption from regenerable AERs using 10 bed volumes (BVs) of 70% methanolic brine solutions, while PFAS-selective resins required more BVs (30) of brines with higher methanol content (90%) or a more hydrophobic cosolvent (n-propanol). Increasing regenerant empty-bed contact time had minimal effect on PFAS desorption. Over 90% methanol recovery from the resulting waste regenerant mixtures was accomplished with negligible PFAS contamination using distillation, leaving a minimal volume of a PFAS-concentrated still bottoms waste that may be further treated for PFAS destruction. Life cycle analyses revealed that groundwater treatment using PFAS-selective AERs operated in a regenerable mode have lower environmental impacts and costs than systems using conventional regenerable AERs and lower treatment costs than systems operated using PFAS-selective resins in a single-use mode. Findings stem from the fact that higher cosolvent requirements for regeneration of PFAS-selective resins lead to greater internal recycling of regenerant solutions and much lower volumes of residual waste still bottoms that require offsite incineration or disposal.

BIOREMEDIATION OF TRICHLOROETHYLENE-CONTAMINATED GROUNDWATER USING GREEN CARBON-RELEASING SUBSTRATE WITH PH CONTROL CAPABILITY
Lee, H.-C., S.-C. Chen, Y.-T. Sheu, C.-L. Yao, K.-H. Lo, and C.-M. Kao.
Environmental Pollution 348:123768(2025)

A green and long-lasting substrate (GLS), featuring a blend of emulsified substrate (ES) and modified rice husk ash (m-RHA) was created to facilitate the bioremediation of TCE-contaminated groundwater. The GLS was prepared by homogenizing a mixture of soybean oil, surfactants (Simple Green™ and soya lecithin), and m-RHA to ensure a gradual release of carbon sources. The hydrothermal synthesis was applied for the production of m-RHA. Analyses demonstrate that m-RHA were uniform sphere-shaped granules with diameters in the micro-scale ranges. Results show that ~83% of TCE could be removed (initial TCE concentration = 7.6 mg/L) with GLS supplement after 60 days. Compared to other substrates without RHA addition, higher TCE removal efficiency, *Dehalococcoides* sp. (DHC) population, and hydA gene (hydrogen-producing gene) copy number were obtained in microcosms with GLS addition. Higher hydrogen concentrations enhanced DHC growth, corresponding to increased DHC populations. The addition of the GLS could provide alkalinity at the initial stage to neutralize the acidified groundwater caused by organic acids produced after substrate biodegradation, which was advantageous to DHC growth and TCE dechlorination. The addition of m-RHA increased TCE removal efficiency due to the m-RHA having a zeolite-like structure with a higher surface area and lower granular diameter, resulting in a more effective initial adsorption effect. Thus, a significant amount of TCE could be adsorbed onto the surface of m-RHA, which caused a rapid TCE removal through adsorption. The carbon substrates released from m-RHA could then enhance the subsequent dechlorination.

IMMOBILIZING S-NZVI@LDO FOR SIMULTANEOUS REMOVAL OF PFOA AND TCE CO-CONTAMINANTS FROM GROUNDWATER
Liu, X., Q. Wang, Z. Zhang, L. Jia, Z. Shen, T. Long, G.Z. Chen, J. He, and X. Song.
Journal of Hazardous Materials 495:138949(2025)

A study applied sulfidated nano zero-valent iron supported on calcined layered double oxides (S-nZVI@LDO) to simultaneously remove TCE and PFOA. A 2 g/L S-nZVI@LDO dose simultaneously removed 73.3% TCE and 37.8% PFOA in pure water, with 49.5% TCE degraded to less chlorinated products and 23.8% adsorbed or unquantified transformation of C_3-C_6 hydrocarbons. Comparative experiments using individual and co-occurring TCE and PFOA revealed that co-existing PFOA and TCE minimally affected their respective removal efficiencies, highlighting the suitability of S-nZVI@LDO for co-contaminant remediation. S-nZVI@LDO achieved optimal TCE and PFOA removal under acidic conditions, surpassing non-composite S-nZVI and LDO. Based on the characterization of S-nZVI@LDO, TCE removal involved reductive dechlorination and sorption via hydrophobic interactions, while PFOA removal was primarily driven by electrostatic interactions and hydrogen bonding. In real groundwater, S-nZVI@LDO achieved 58.2% TCE and 33.7% PFOA removal. S-nZVI@LDO also simultaneously removed nine different PFAS from a 12-PFAS mixture and demonstrated greater effectiveness for long-chain PFAS and their alternatives owing to their hydrophobic nature.

EXPOSURE OF FREE-RANGING WHITE-TAILED DEER (ODOCOILEUS VIRGINIANUS) TO PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) AT PFAS-IMPACTED SITES IN MINNESOTA
LaSharr, K., D.P. Scher, S. Streets, M. Carstensen, B. Keller, and J. Kelly.
Chemosphere 386:144642(2025)

PFAS levels were assessed in wild white-tailed deer (*Odocoileus virginianus*), an important food source in Minnesota. Forty PFAS were screened in liver samples (n = 116) collected from deer harvested by hunters near three PFAS-impacted sites. Seventeen PFAS compounds were detected at least once in liver samples, with PFOS found in 100% of liver samples and PFDA and PFBA detected in > 50% of liver samples. The seven PFAS found in liver samples above 1 ng/g (and their maximum concentrations) were PFOS (96.0 ng/g), 6:2 FTS (48.4 ng/g), PFBA (9.14 ng/g), NFDHA (5.75 ng/g), PFOA (4.84 ng/g), PFHxS (2.78 ng/g), and PFHpA (2.42 ng/g). Statistically significant differences in PFAS concentrations were found between sites; PFAS profiles were generally consistent with the known or suspected PFAS sources at the three sites. Total PFAS concentrations also differed between deer life stage-sex groups, with adult males having significantly higher concentrations of total PFAS compared to adult females and male fawns. To assess human consumption potential, paired deer muscle samples were evaluated when liver PFOS reached a concentration threshold of ≥20 ng/g (n = 17 muscle samples). PFOS was the most frequently detected PFAS in muscle (88% detection frequency), with PFOS liver levels ~2 orders of magnitude higher than in the paired muscle tissue. The data are important to determine if public health interventions, such as localized consumption advisories, are warranted. https://www.sciencedirect.com/science/article/pii/S0045653525005892/pdfft?md5=6d8b55b89f0ee01c4ecb9134a477a352&pid=1-s2.0-S0045653525005892-main.pdf

OVERCOMING ANALYTICAL CHALLENGES OF OTHER TEST METHOD 50: ANALYSIS OF VOLATILE FLUORINATED COMPOUNDS IN PASSIVATED CANISTERS FROM STATIONARY SOURCE EMISSIONS
Wallace, M.A.G., S.R. Jackson, W.T. Preston, L. Miles, H. Calder, S. Davies, and M. Cumbes.
Journal of Chromatography A 1759:466226(2025)

EPA developed Other Test Method (OTM)-50, a canister sampling and thermal desorption-gas chromatography/mass spectrometry (TD-GC/MS) analysis method to measure volatile fluorinated compounds (VFCs) from stationary source emissions. This study describes experiments that were conducted to develop optimized analytical methods for samples that may contain high humidity and carbon dioxide (CO_2) levels. A prototype preconcentrator with a focusing trap capable of reaching -100°C was used to improve retention of tetrafluoromethane (CF_4), but the lower temperature also trapped more CO_2, causing signal suppression of CF_4 as well as hexafluoroethane, chlorodifluoromethane, tetrafluoroethene, and trifluoromethane. Therefore, the optimized method utilized a low trap temperature of -30°C to avoid trapping high levels of CO_2 that may be present in stationary source samples. Increasing the dry purge time to nine minutes during preconcentration eliminated enough CO_2 to recover target compounds within ± 30% of the standard value, as required by OTM-50. The method was used to analyze samples collected in the absence and presence of high CO_2 levels to demonstrate the precision of the method even under challenging conditions.

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General News

IN SITU CHEMICAL OXIDATION (ISCO) IMPACT ON PFAS FATE AND TRANSPORT
EPA Superfund Program - RPM Technical Bulletin, 25 pp, August 2025

EPA's Superfund Program developed this technical bulletin to guide RPMs in evaluating in situ chemical oxidation (ISCO) for PFAS-contaminated sites. The bulletin highlights that ISCO can convert PFAS precursors into more recalcitrant PFAS, complicating remediation efforts. Different oxidants used in ISCO, such as persulfate and hydrogen peroxide, have varying effects on PFAS and their precursors, depending on environmental conditions like pH levels and organic carbon content. While ISCO can degrade some PFAS precursors (such as fluoroalcohols and ethers), degraded PFAS precursors often transform into terminal PFAS (such as PFOA, PFOS) that are more resistant to remediation. It may also enhance PFAS mobility by altering aquifer chemistry. To address these challenges, the bulletin recommends bench-scale studies and thorough groundwater monitoring to assess ISCO's potential impact on PFAS fate and transport. It suggests using the Total Oxidizable Precursor (TOP) assay, nontargeted analysis (NTA) and organofluorine analysis (AOF/EOF) to identify PFAS precursors that might lead to increased PFAS contamination. The bulletin underscores the importance of site-specific evaluations to determine the feasibility and risks of deploying ISCO and provides examples for how to evaluate a PFAS-contaminated site for continued use of ISCO.
https://www.epa.gov/system/files/documents/2025-09/in-situ-chemical-oxidation-isco-impact-on-pfas-fate-and-transport.pdf

ENHANCED MONITORED NATURAL RECOVERY (EMNR) FOR SEDIMENT SITES
NAVFAC Fact Sheet, 5 pp, 2025

EMNR is a remedial approach that builds upon monitored natural recovery, which relies on natural processes such as sediment deposition, dissolution, chemical transformation, and/or the reduction in exposure to chemicals in surficial sediment over time. EMNR is an in situ remedial approach that involves placing a thin layer of clean sand or sediment over impacted sediment to accelerate natural recovery processes. This fact sheet outlines the technology background, criteria for selecting suitable sediment sites, and EMNR implementation. In addition, two case studies are included that demonstrate the successful application of EMNR at Navy sites. This information will aid in discussions with stakeholders about the benefits of implementing EMNR at impacted sediment sites.
https://exwc.navfac.navy.mil/Portals/88/Documents/FXWC/Restoration/er_pdfs/e/NAVFAC%20EMNR%20Fact%20Sheet%20Aug%202025.pdf?ver=1KyGGrUrrZA1U2YDGmVTew%3d%3d

INNOVATIVE SOLIDIFICATION AND STABILIZATION TECHNIQUES USING INDUSTRIAL BY-PRODUCTS FOR SOIL REMEDIATION
Petrillo, A., F. Fraternali, F. Colangelo, and I. Farina.
Applied sciences 15(7):4002(2025)

A study focused on the theoretical definition and optimization of a green material mix to be used in the solidification process of contaminated industrial soil to ensure treatment effectiveness. The mix design was developed through a literature analysis, representing a preliminary theoretical study. The paper explores the application of the solidification and stabilization process using various additives, including Portland cement, fly ash, ground granulated blast furnace slag, and other industrial waste materials, to create an effective mix design for contaminated soil. The main objective is to reduce the permeability and solubility of contaminants while simultaneously improving the mechanical properties of the treated materials. The properties of the studied soils are described along with those of the green materials used, providing a comprehensive overview of the optimization of the resulting mixtures. https://www.mdpi.com/2076-3417/15/7/4002

CHAPTER ONE -ADVANCES IN METAL(LOID) IN SITU SOIL REMEDIATION AND POTENTIAL INFLUENCES OF CHANGING ENVIRONMENTAL CONDITIONS
Sowers, T., M. Fischel, H. Peel, J. Fischel, A. Betts, and S. Bone.
Advances in Agronomy 194:1-53(2025)

This chapter discusses a subset of in situ remediation methods that represent promising options for treating high-priority metal(loid) contaminants, specifically lead, mercury, arsenic, chromium, and uranium. The chapter evaluates unique chemistries associated with cation, oxyanion, and radionuclide contaminants. Mobility of these elements when subjected to environmental changes from sea level rise, flooding, and wildfires are also explored. There is great uncertainty regarding how remediated contaminants will respond when exposed to changing soil conditions promoted by shifts in the surrounding environment. Further exploration is essential to understanding metal(loid) contaminant biogeochemical cycling and estimating the reduction in exposure post-remediation.

PREDICTIVE MODELING OF PFAS BEHAVIOR AND DEGRADATION IN NOVEL TREATMENT SCENARIOS: A REVIEW
Olawade, D.B., J.O. Ijiwade, O. Fapohunda, A.O. Ige, D.O. Olajoyetan, and O.Z. Wada.
Process Safety and Environmental Protection 196:106869(2025)

This narrative review explores advancements in predictive models for PFAS remediation, focusing on methods that incorporate PFAS structural characteristics, environmental factors, and treatment type. Three main modeling approaches discussed are empirical, mechanistic, and machine learning models, each with unique strengths and limitations depending on data availability and treatment conditions. The review also addresses recent developments in advanced treatment systems, such as advanced oxidation processes, electrochemical treatment, and adsorption, as well as the role of machine learning in optimizing treatment predictions. Key challenges, including data limitations, transformation product toxicity, and model validation, are examined, with recommendations for future research emphasizing data expansion, integration of toxicity predictions, and enhanced model interpretability. By tailoring predictive models to PFAS-specific variables and diverse treatment conditions, researchers can advance sustainable PFAS management practices and guide effective remediation strategies for contaminated sites.
https://www.sciencedirect.com/science/article/pii/S0957582025001363/pdfft?md5=fbcea95cd5e6fbfcab45e146ec811533&pid=1-s2.0-S0957582025001363-main.pdf

The Technology Innovation News Survey welcomes your comments and suggestions, as well as information about errors for correction. Please contact Michael Adam of the U.S. EPA Office of Superfund and Emergency Management at adam.michael@epa.gov or (703) 399-4268 with any comments, suggestions, or corrections.

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