Entries for September 1-15, 2024

Market/Commercialization Information

R -- R7 SUPERFUND TECHNICAL ASSESSMENT & RESPONSE TEAM 6 (START VI) (SRCSGT)
U.S. Environmental Protection Agency, Region 7 Contracting Office, Lenexa, KS
Contract Opportunities on SAM.gov 68HE0725R0002, 2024

This is a sources sought notice for marketing research purposes only under NAICS code 541620. EPA Region 7 seeks to identify firms capable of implementing EPA responsibilities under the national response system for the Superfund Technical Assessment and Response Team (START) class of contracts supporting EPA On-Scene Coordinators and other federal officials. These services primarily support Region 7's Superfund and Emergency Management Division. The contractor shall be prepared to provide professional scientific/technical support services and align its activities with EPA activities to respond to the release, or threat of release, of hazardous materials, oil, and weapons of mass destruction to protect human health and the environment. Contract responsibilities include providing 24-hour, seven-days-a-week response activities, including emergency, counter-terrorism, oil spill, federal disaster, PRP, and minor containment response, and fund-lead removals; Preparedness and Prevention Activities; Assessment/Inspection Activities; Technical Support Activities; Data Management and Mapping Support; and Training. Capability statements are due by 1:00 PM CDT on October 22, 2024. https://sam.gov/opp/b91529b13b4443549cc3d7727b1b7825/view

F -- RAYMARK SUPERFUND SITE, STRATFORD CT: OPERABLE UNITS (OUS) 5 (SHORE ROAD) & 6 (MORGAN FRANCIS) (PRESOL)
U.S. Army Corps of Engineers, North Atlantic Division, New England District, Concord, MA
Contract Opportunities on SAM.gov W912WJ24R0017, 2024

When this solicitation is released in October or November 2024, it will be competed as a total small business set-aside under NAICS code 562910. The USACE New England District is issuing this Presolicitation Notice for an IDIQ contract to prospective 8(a), HUBZone, Women-Owned, Service-Disabled Veteran-Owned, and Small Businesses to perform services for Raymark Superfund Site, Operable Unit (OU) 5 (Shore Road) & OU6 (Morgan Francis). The Raymark Superfund Site includes areas contaminated by manufacturing processes from the former Raymark facility. Specifically, contaminated waste material was used as fill in various locations within Stratford, CT. The proposed work is to remediate OUs 5 and 6. OU5 requires excavating and offsite disposing of ~10,000 yd^3 of contaminated soil (primarily PCBs, metals, and asbestos) and site restoration. OU6 requires excavating ~5,000 yd^3 of waste from an adjacent creek, restoration, consolidating waste on the Morgan Francis Property, and constructing a ~6-acre RCRA hazardous waste landfill cap (average thickness of 4' and consist of a low permeability liner system with soil cover) and supporting infrastructure. The site abuts a residential area of town, so significant air monitoring, dust control, traffic management, and public safety requirements are part of this project. The project components include remediation, including excavating and restoring OU5; remediating, including excavating and restoring a section of creek adjacent to Morgan Francis; RCRA cap constructed per design and specifications; supporting infrastructure, including but not limited to stormwater basins, swales, gas vent system, utility corridors, access roads; and robust air monitoring and dust prevention practices. There is no solicitation at this time. https://sam.gov/opp/d438c3467279f4556b5ffc685b59bd5f/view

ARCHITECT-ENGINEERING SERVICES FOR COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY VII (CLEAN VII), NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND PACIFIC (SRCSGT)
Department of the Navy, Naval Facilities Engineering Systems Command (NAVFAC), Joint Base Pearl Harbor-Hickam, HI
Contract Opportunities on SAM.gov N6274225R1800, 2024

This sources sought is for planning and market research purposes only. Naval Facilities Engineering Systems Command seeks to identify potential Section 8(a) small business concerns, Historically Underutilized Business Zone small business concerns, woman-owned small business concerns, service-disabled veteran-owned small business concerns and small business concerns under NAICS code 541330 capable of providing professional Architect-Engineer services in support of the Department of the Navy's Environmental Restoration Program consisting of the Installation Restoration (IR) Program and Munitions Response Program in compliance with CERCLA and other similar programs. The work to be ordered under this contract will be performed at various locations within NAVFAC's Pacific area of Responsibility for Environmental Restoration Program. The exact location of the required effort will be specified in the individual Contract Task Orders (CTOs). The Contractor may occasionally be tasked to perform work for other NAVFAC Components, DoD, or federal agencies as required by the Government. This contract may include work on private, county, or state lands associated with the above-mentioned environmental sites. The type of services expected to be performed under this contract consists of, but are not limited to, evaluating existing site information; preparing project planning documents; performing field investigations; analyzing environmental samples; validating and evaluating analytical data; performing human health and ecological risk assessments; participating in meetings with the Navy, natural resource trustees, and regulators; providing community relations support; preparing remedial designs; performing construction oversight; and preparing project reports. The Government will order all work performed during the life of the contract on an as-needed basis through the issuance of CTOs. Award of a CTO is contingent upon the Government and the Contractor agreeing on the estimated cost and fixed fee amount. The contract term is anticipated to be a 12-month base period with four 12-month option periods or $980,000,000, inclusive of fixed fees, whichever occurs first. Capabilities statements are due by 10:00 AM HST on November 4, 2024. https://sam.gov/opp/883fa64770bd46c1a6dd8764d722be12/view

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Cleanup News

CASE STUDIES AND ANALYSIS OF SUSTAINABLE REMEDIATION TECHNIQUES AND TECHNOLOGIES
Sweeney, R., N. Harries, and P. Bardos. Concawe, Report No. 11/23, 126 pp, 2023

A study was commissioned to a) gather, prepare, and publish ten European case studies that demonstrate sustainable remediation techniques and technologies and b) provide an analysis of the case studies to identify key success factors that facilitated the adoption and success of these projects at different sites. The 20 case studies identified were scored on how closely they matched ISO Standard on Sustainable Remediation 18504:2017, its relevance to Concawe, and its ability to be delivered on time. A cross-comparison analysis of the ten case studies was carried out to help practitioners compare the studies to their projects. The analysis focused on the following attributes: site location and type of site (former use); saturated/unsaturated zone impact; targeted contaminants; risk drivers; envisaged land use; objectives for sustainability assessment; remediation options compared; stakeholder engagement; boundary conditions; scope (environmental, economic, social); key constraints/opportunities; and assessment type (qualitative, semi-quantitative etc). Working with a risk-based conceptual site model, effective stakeholder engagement, and a sound understanding of sustainable remediation practices are key success factors from these case studies. Based on this analysis and recently published guidance, a practical approach for deploying sustainable remediation on operational sites was proposed.
https://www.concawe.eu/wp-content/uploads/Rpt_11-23.pdf

BIOREMEDIATION OF PAHS-CONTAMINATED SITE IN A FULL-SCALE BIOPILING SYSTEM WITH IMMOBILIZED ENZYMES: REMOVAL EFFICIENCY AND MICROBIAL COMMUNITIES
Wang, L., G. Chen, X. Du, M. Li, Z. Zhang, H. Liang, and D. Gao.
Environmental Research 262(Part 1):119763(2024)

The extracellular enzymes from white rot fungi were fully applied to treat PAH-contaminated sites by combining a new hydrogel microenvironment and a biopiling system. Seven of the 12 PAHs identified are considered a threat to the soil quality of construction sites, with benzo[a]pyrene levels reaching 1.50 mg/kg, surpassing the acceptable limit of 0.55 mg/kg for this type of land. After seven days of treatment, the benzo[a]pyrene level decreased from 1.50 mg/kg to 0.51 mg/kg, reaching the remediation standard of Class I screening values, with a removal rate of 66%. Microbiomes were utilized to assess the microbial biodiversity and structure analyses for PAH biodegradation. The remediation enhanced the abundance of dominant bacterium (*Marinobacter*, *Pseudomonas*, and *Truepera*) and fugi (*Thielavia*, *Neocosmospora*, and *Scedosporium*).
https://www.sciencedirect.com/science/article/pii/S0013935124016682/pdfft?md5=e9276c189e8767448af83a43dacd7533&pid=1-s2.0-S0013935124016682-main.pdf

REMEDIATING BEDROCK: WHAT ONCE WAS IMPOSSIBLE IS NOW ROUTINE. THREE CASE STUDIES
Cowan, E. I 14th Annual SABCS Workshop & Conference on Contaminated Sites, 25-26 September, British Columbia, Canada, 59 slides, 2024

This presentation provides an overview of bedrock remediation challenges before demonstrating the evolution of bedrock site remediation technologies through three recent and varied bedrock remediation sites. One site was contaminated with heavily impacted groundwater and separate phase petroleum hydrocarbons, a second site contained the dissolved chlorinated solvent (i.e., TCE or PCE) contamination, while a third site was impacted with heavy metals, specifically hexavalent chromium. For each site, the remediation approach was presented along with pre-remediation and post-remediation groundwater quality analytical results. Recommendations and insights into state-of-the-art bedrock remediation amendments and approaches that can be employed for successful in situ fractured bedrock remediation are discussed. https://sabcs.ca/wp-content/uploads/2024/10/240_Cowan_Remediating-Bedrock_Final_092524.pdf

SUSTAINABLE PFAS REMEDIATION; LIFE CYCLE ANALYSIS (LCA) OF COLLOIDAL ACTIVATED CARBON COMPARED TO PUMP-AND-TREAT
Henderson, B. I The Seventh Annual Western Groundwater Congress, 7-9 October, Lake Tahoe, CA, abstract only, 2024

The presentation compares the environmental impact of long-term in situ sequestration using colloidal activated carbon (CAC) to pump & treat for PFAS treatment. A Life Cycle Analysis (LCA) was completed on the CAC material to quantify the sustainability of the in situ approach, with boundaries encompassing 'cradle to grave': considering upstream material sourcing, core manufacturing processes, and the downstream processes of transport and injection. The LCA was undertaken according to ISO14040/14044/ISO14067 by using GaBi Professional software to meet EN15804 standards and create an Environmental Product Declaration. The environmental impact of an actual CAC application downgradient of the PFAS source at a commercial airport was analyzed. A comparative analysis was conducted by designing an alternative "pump and treat" system using two filtration techniques and assessing its environmental impact using GaBi Professional software. A Life Cycle Cost Analysis was also completed using net present value. Lastly, a Tier 2 sustainability assessment using the SURE model, considering 15 sustainability indicators, was completed for each remedial approach. *See recording of Regensis webinar:* https://www.youtube.com/watch?v=bioTZ88lc3U

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Demonstrations / Feasibility Studies

FIELD DEMONSTRATIONS OF ENHANCED CONTACT PLASMA FOR PFAS DESTRUCTION: LESSONS LEARNED
Knutson, W., S. Mededovic, T. Holsen, K. Camarco.I Battelle 2024 Chlorinated Conference, 2-6 June, Denver, CO, 21 slides, 2024

This presentation provides an overview of enhanced contact plasma reactors for the destruction of PFAS and results from field demonstrations. Plasma technology uses electricity to convert water into a mixture of highly reactive species that rapidly and non-selectively degrade and a broad PFAS spectrum, including PFOA, PFOS, and shorter-chain PFAS. The plasma reactor can simultaneously oxidize and reduce organics by producing a mixture of OH radicals and aqueous electrons that act as strong reducing agents and are the key species in removing PFAS and other non-oxidizable compounds. The Co-PRe™ uses multipoint high-voltage electrodes to generate plasma. Gas diffusers are positioned on the bottom of the reactor to pump argon gas through the diffusers continuously. This produces bubbles and forms a foam layer on the liquid surface that concentrates PFAS and enhances the contact between the liquid and the plasma. PFAS are exposed at the interface to reactive species in the plasma. The technology has been used to treat extracted groundwater, still bottoms produced from the regeneration of ion exchange regenerant, AFFF rinsate generated from the cleaning of fire trucks, and nanofiltration membrane concentrate from DoD sites in the field. Depending on initial concentrations, either batch or flow-through mode (flow rates up to 10 gpm) was used. Regardless of the source water, removal rates of long-chain perfluoroalkyl acids and PFAS precursors (fluorocarbon chain ≥ 6) rapidly reached non-detect levels. Shorter chain removal rates were slower; adding a cationic surfactant significantly increased removal rates, and concentrations reached non-detect levels with longer treatment. The treatment trailers were upgraded with improved reactor design and automation for unattended operation.
https://vrcdacademy.s3.amazonaws.com/battelle/2024_Chlorinated/F4_1120_416_Knutson.pdf

USE OF CUTTING-EDGE MOLECULAR MICROBIAL TECHNOLOGIES TO DRIVE A SUCCESSFUL, NOVEL, ANAEROBIC EISB BIOREMEDIATION
Jennings, E.M., R. Patel, and T. Franz. I Battelle 2024 Chlorinated Conference, 2-6 June, Denver, CO, 21 slides, 2024

A comprehensive biogeochemical assessment was performed at a historical refinery to determine if enhanced in situ bioremediation (EISB) would successfully reduce benzene concentrations under anaerobic conditions and how to maximize its effectiveness. The assessment merged traditional geochemical parameters with a unique consortium of innovative molecular biological tools. Stable isotope analyses confirmed and tracked benzene biodegradation. Next-generation molecular sequencing arrays were performed to directly monitor the entire indigenous microbial population and the full suite of metabolic functions performed by the community. Finally, a series of investigations into the indigenous Deltaproteobacterium sp. ORM-2 population was conducted. The lab studies resulted in a site-specific profile of the current status of indigenous benzene biodegradation. Information from these studies was used to develop the EISB pilot study using the in situ enhancement of a benzene-biodegrading microbial population. Benzene concentrations decreased by up to 99% due to the EISB injections. The project dramatically underscores the benefit of performing often-neglected efforts during the planning stages of an EISB field-scale pilot test. Combining traditional site monitoring methods with cutting-edge molecular technologies can provide invaluable information about indigenous microbial activities, maximizing the potential for successful EISB of targeted and recalcitrant COCs. https://vrcdacademy.s3.amazonaws.com/battelle/2024_Chlorinated/G5_1325_139_Jennings.pdf

ADVANCING THE USE OF SUCTION LYSIMETERS TO INFORM SOIL LEACHING AND REMEDIATION OF PFAS SOURCE ZONES
Rayner, J.L., A. Lee, S. Corish, S. Leake, E. Bekele, and G.B. Davis.
Groundwater Monitoring & Remediation 44(3):49-60(2024)

This article reports outcomes of lysimeter investigations conducted across three sites and 18 lysimeters within fine-textured soil profiles. Soil cores from the same locations were recovered. PFAS concentrations in soils and lysimeter porewater were compared with prior lab investigations. Variable concentration distributions with depth of PFAS in soils were found with a max PFAS sum of ~56 mg/kg, dominated by PFOS. The max PFAS sum in porewater was 13.5 mg/L. Comparison across all collocated soil and porewater concentrations did not provide consistent trends. PFAS mass fractions within lysimeter porewater samples were much higher for most PFAS than mass fractions determined from lab investigations, but the fraction was lower for PFOS. Results indicate preferential recovery of individual shorter chain PFAS via leaching at lower liquid: soil ratios such as those experienced under suction during recovery of porewater by lysimeters. Suggestions are offered to advance the use of suction lysimeters in promoting porewater PFAS concentrations as an alternative for regulatory compliance and closing the gap between field and lab approaches.

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Research

ARE GEOTEXTILES SILENT CONTRIBUTORS OF ULTRASHORT CHAIN PFASS TO THE ENVIRONMENT?
Mikhael, E., A. Bouazza, W.P. Gates, and D. Gibbs.
Environmental Science & Technology 58(20):8867-8877(2024)

The presence of PFAS in woven and nonwoven polypropylene geotextiles and four nonwoven polyester geotextiles commonly used in modern geosynthetic composite lining systems for waste containment facilities such as landfills was investigated. Targeted analysis for 23 environmentally significant PFAS molecules and methods for examining "PFAS total" concentrations were used to assess their occurrence. Most geotextile specimens contained PFPrA with concentrations ranging from non-detect to 10.84 µg/g. Average PFPrA concentrations of PFPrA were higher in polypropylene than in polyester geotextiles. PFAS total parameters comprising total fluorine and total oxidizable precursors indicated no significant precursor mass or untargeted intermediates were present in geotextiles. The study identified geotextiles as a possible source of ultrashort PFAS in engineered lined waste containment facilities, which may contribute to the overall PFAS total concentrations in leachates or liquors they are in contact with. Findings may lead to further implications on the fate and migration of PFAS in geosynthetic composite liners, as previously unidentified concentrations, particularly of ultrashort-chain PFAS, may impact the extent of PFAS migration through and attenuation by constituents of geosynthetic composite liner systems.

RESEARCH BRIEF 358: PASSIVE SAMPLERS TRACK PFAS, SHOW CONTAMINATION REDUCTION IN CAPE FEAR RIVER
National Institute of Environmental Health Sciences, Superfund Research Program, October 2024

Common low-cost samplers may be an effective technology for tracking PFAS levels in aquatic environments, according to a study funded by the NIEHS Superfund Research Program. The research team found that frequently used passive sampling devices, which collect samples over time, can monitor how PFAS mitigation strategies affect PFAS levels along a stretch of the Cape Fear River in North Carolina. Study results show that solid phase adsorption toxin tracking (SPATTs) are effective in monitoring PFAS levels in aquatic environments and can provide insight into how PFAS levels change over time. https://tools.niehs.nih.gov/srp/researchbriefs/view.cfm?Brief_ID=358

Β-LACTOGLOBULIN ENHANCES CLAY AND ACTIVATED CARBON BINDING AND PROTECTION PROPERTIES FOR CADMIUM AND LEAD
Lilly, K., M. Wang, A.A. Orr, S.E. Bondos, T.D. Phillips, and P. Tamamis.
Industrial & Engineering Chemistry Research 63(37):16124-16140(2024)

A study aimed to develop multicomponent composites as inexpensive and environmentally friendly sorbents with enhanced capture of cadmium (Cd) and lead (Pb). The composites are based on calcium montmorillonite (CM) and activated carbon (AC) because of their proven effectiveness as sorbents for diverse toxins in environmental settings. Computational and experimental methods were used to delineate that beta-lactoglobulin enhances CM and AC binding and protection properties for Cd and Pb. Modeling and molecular dynamics simulations investigated material systems formed by CM and AC in complex with beta-lactoglobulin and predicted their capacity to bind heavy metal ions at neutral pH conditions. Simulations suggest that the enhanced binding properties of the material systems are attributed to the presence of several binding pockets formed by beta-lactoglobulin for the two heavy metal ions. At neutral pH conditions, divalent Cd and

Pb shared comparable binding propensities in all material systems, with the former being consistently higher than the latter. To validate the interactions depicted in simulations, two ecotoxicological models (*L. minor* and *H. vulgaris*) were exposed to Cd, Pb, and a mixture of the two. Including CM-lactoglobulin (beta-lactoglobulin amended CM) and AC-lactoglobulin (beta-lactoglobulin amended AC) at 0.05-0.2% efficiently and dose-dependently reduced the severe toxicity of metals and increased the growth parameters. This high efficacy of protection shown in the ecotoxicological models may result from numerous possible interaction pockets of the beta-lactoglobulin-amended materials depicted in simulations. The ecotoxicological models support the agreement with computations. The study serves as a proof of concept on how computations in tandem with experiments can be used to design multicomponent clay- and carbon-based sorbent amended systems with augmented functionalities for particular toxins.

MICROFILTRATION MEMBRANE PORE FUNCTIONALIZATION WITH PRIMARY AND QUATERNARY AMINES FOR PFAS REMEDIATION: CAPTURE, REGENERATION, AND REUSE

Thompson, S., A.M. Gutierrez, J. Bukowski, and D. Bhattacharyya.
Molecules 29(17):4229(2024)

Commercial microfiltration membranes were modified using pore functionalization to incorporate an anion-exchange moiety within the membrane matrix to reduce contaminants in concentrated retentate streams as part of conventional wastewater treatment. The functionalization was performed with primary and quaternary amine-containing polymer networks ranging from weak to strong basic residues. Membrane loading ranged from 0.22 to 0.85 mmol/g (quaternary) membrane and 0.97 to 3.4 mmol/g (primary) membrane. Modified membranes exhibited a range of water permeances within ~45-131 LMH/bar. PFAS removal from aqueous streams was analyzed for PFOA and PFBA. Synthesized membranes demonstrated up to 90% PFOA rejection and 50-80% PFBA rejection after 30% permeate recovery. Regenerated membranes maintained the capture performance for three cycles of continuous operation. Capture and reuse efficiency can be improved by considering charge density, water flux, and influent contaminant concentration. The substrate does not limit this process and can be implemented on other platforms. https://www.mdpi.com/1420-3049/29/17/4229

3D STRUCTURE-FUNCTIONAL DESIGN OF A BIOMASS-DERIVED PHOTOCATALYST FOR ANTIMICROBIAL EFFICACY AND CHEMICAL DEGRADATION UNDER AMBIENT CONDITIONS

Zhang, W., Y. Liang, C. Hu, W. Li, J. Lai, K. Chen, S. Xiang, D. Niedzwiedzki, J. Wu, A. Li and S. Dai.
Green Chemistry 26:10139-10151(2024)

A study reports functional structure design using lignin, a renewable carbon heterogeneous polymer, to synthesize a highly efficient and stable photocatalyst that rapidly degrades environmentally hazardous organic compounds. A hydrolysis reaction between Ti-OH and the hydroxyl groups of lignin established Ti-O-C and Ti-O-Ti bonds and a lignin-based photocatalyst with a hollow sphere structure (C_{lignin}@H-TiO_2) was formed. A homozygous carbon-modified TiO_2 structure contributed to the enhanced photodegradation activity with solar light. Close hetero-interfacial contact between carbonized lignin and TiO_2 further improved the photocatalytic efficiency by facilitating effective charge carrier separation. After synthesis optimization, the resulting C_{lignin}@H-TiO_2 photocatalyst degraded atenololunder solar light irradiation, with 100% degradation occurring within five minutes. In addition, it efficiently removed~50% of PFOA, destroying ~90% of bacteria within 3 hours. The uniform distribution of lignin within the crosslinking structures ensured a durable carbon-modified TiO_2 framework, which remains stable after 10 usage cycles. The robustness of the lignin-based photocatalyst enabled incorporation of the catalyst into diversified material formats and various usages. Photocatalyst coating onto device surfaces showed bacterial-destroying efficacy under sunlight. A 3D structural lignin-based photocatalyst achieves high PFAS degradation and rapid pathogen sterilization efficiency under ambient conditions. https://pubs.rsc.org/en/content/articlepdf/2024/gc/d4gc01246a

BIOREMEDIATION OF CHLORATE AND CHROMIUM IN SOIL COLUMNS USING CONTAMINATED SITE NATIVE CULTURE

Motevasselin, M., B. Gorczyca, I. Kalinovich, R. Sparling, R. Sri Ranjan.
Groundwater Monitoring & Remediation 44(2):30-38((2024)

Continuous flow column experiments were performed in a study using soil from a chlorate-chromate-impacted site in Manitoba, Canada. Synthetic groundwater was amended with acetate, nitrogen, and phosphorous to evaluate the potential for in situ groundwater treatment. Concentrations of chromate and chlorate measured in the columns' effluent water dropped by 86% and 96%, respectively. However, increased biomass and precipitation of trivalent chromium reduced the water flow rate in the columns, which is a concern for implementing this method as a long-term in situ remediation solution. https://ngwa.onlinelibrary.wiley.com/doi/epdf/10.1111/gwmr.12643

THE ROLE OF ROTATED POTENTIAL MIXING PROTOCOLS ON THE BEHAVIOR OF A CONSERVATIVE REAGENT

Cho, M.S., N.R. Thomson. I Groundwater Monitoring & Remediation 44(2):86-100(2024)

A study relied on conventional models used by remediation practitioners to represent the expected flow and transport behavior of a conservative reagent subjected to chaotic advection by a rotated potential mixing (RPM) flow system, and then explored the impact of engineering controls on reagent mixing behavior. Lines of evidence demonstrated that the modeling approach captured the key features of the expected transport behavior reported in other studies. Visual observations of the reagent distribution and quantitative metrics of mixing behavior highlighted the different responses that are possible by the various combinations of RPM flow parameters explored. Results show the importance of combining theoretical considerations with practical limitations when designing an RPM flow system. The flow rate and pumping duration have direct consequences on the degree of reagent spreading and mixing. The use of the same RPM flow protocol in a heterogeneous K field led to a significantly greater degree of reagent mixing than in a homogeneous K system. Results have important implications for designing RPM flow protocols to promote enhanced reagent mixing and thereby improve treatment effectiveness. https://ngwa.onlinelibrary.wiley.com/doi/epdf/10.1111/gwmr.12648

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General News

GUIDANCE ON THE ASSESSMENT AND MONITORING OF NATURAL ATTENUATION OF CONTAMINANTS IN GROUNDWATER.

CL:AIRE (Contaminated Land: Applications in Real Environments), Reading. ISBN 978-1-905046-42-3, 137 pp, 2024

This guidance updates the UK Environment Agency's technical guidance for monitored natural attenuation (MNA) published in 2000. It captures significant scientific advances that have been made in understanding contaminant behavior and reactive transport in the subsurface, alongside ongoing developments in site characterization, monitoring, and predictive modeling approaches and technologies. These evolving methods enhance contaminant and process-specific understanding required to develop advanced conceptual site models for MNA, addressing complexities and uncertainties that were previously challenging to deal with. These advancements further support the development of three lines of evidence typically considered to demonstrate the effectiveness of natural attenuation for risk management in groundwater:

- Primary: reduction in contaminant concentration, mass and/or mass discharge in groundwater;
- Secondary: geochemical data and modeling that provides indirect evidence of the natural attenuation processes likely causing the observed reductions in contamination (primary line of evidence); and
- Tertiary: contaminant and/or process-specific evidence to support the primary and secondary lines of evidence.

The phased approach described in this guidance supports the identification of contaminant plumes for which MNA is likely feasible, then demonstrates the ability of natural attenuation to protect receptors now and in the future, before undertaking a monitoring program to confirm MNA will achieve remedial objectives within a timeframe suitable for all stakeholders.
https://claire.co.uk/component/phocadownload/category/22-important-industry-documents?download=993:mna-guidance

DEVELOPING AND DEMONSTRATING TECHNOLOGIES FOR THE DESTRUCTION OF PFAS IN CONCENTRATED LIQUID WASTE STREAMS

Hart, M. SERDP & ESTCP Webinar Series, September 2024

This SERDP and ESTCP webinar focuses on DoD-funded research efforts to develop and demonstrate technologies for PFAS destruction in concentrated liquid waste streams. Specifically, investigators discuss the validation of a novel photocatalytic media and the demonstration of hydrothermal alkaline treatment for PFAS treatment.
https://serdp-estcp.mil/webinars/details/bc356e86-18c8-49ed-b674-ba4bbbc601e8/developing-and-demonstrating-technologies-for-the-destruction-of-pfas-in-concentrated-liquid-waste-streams

UNDERSTANDING PFAS TOXICITY IN AFFF-IMPACTED MARINE ENVIRONMENTS AND RELATIVE TOXICITIES OF PFAS-FREE FOAMS

Chen, C. and C. McDonough. SERDP & ESTCP Webinar Series, October 2024

This SERDP and ESTCP webinar focuses on DoD-funded research efforts to study PFAS bioaccumulation in aquatic species. Specifically, investigators will discuss impacts to marine food webs and benthic biota exposed to impacted marine sediments associated with aqueous film-forming foam (AFFF) impacts, as well as research on acute and chronic toxicity of PFAS-free foam alternatives.
https://serdp-estcp.mil/events/details/35e5ae25-4f61-4053-be47-81e9001c62d2/understanding-pfas-toxicity-in-afff-impacted-marine-environments-and-relative-toxicities-of-pfas-free-foams

PASSIVE SAMPLING TECHNOLOGY UPDATE

Interstate Technology and Regulatory Council Website, PSU-1, 2024

This guidance document combines the previous ITRC Passive Sampling documents (DSP-1, DSP-3. DSP-4, DSP-5) along with updates to the technologies into one comprehensive document that evaluates 24 passive sampling technologies. The document explores the use of these technologies and application of the data gathered to all phases of environmental remediation. This document is intended to be used by regulators and stakeholders currently sampling environmental media at sites undergoing evaluation, remediation, or monitoring for compliance with applicable laws and regulations. https://psu-1.itrcweb.org/

CONSIDERATION OF VADOSE ZONE MOISTURE DYNAMICS IN REMEDIATION OF PFAS-IMPACTED SOILS

Askarani, K.K., J.S. Cook, J.A. Connor, and C.J. Newell.
Groundwater Monitoring & Remediation 44(3):122-127(2024)

The soil moisture characteristic curve, wetting front dynamics, and the moisture redistribution cycle to understand the potential behavior of different PFAS in the vadose zone are explored in this article. Drawing on experience with remediating soils impacted by brine spills, the authors provide recommendations on the design and implementation of soil excavation, covering remedies such as capillary barriers to prevent recontamination.

CLEANUP 2024: 10TH INTERNATIONAL CONTAMINATED SITE REMEDIATION CONFERENCE, PROGRAM AND PROCEEDINGS

CRC Care: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Australia. ISBN: 978-1-921431-95-1, 535 pp, 2024

The 10th International Contaminated Site Remediation Conference was held at the Adelaide Convention Center in South Australia, September 15-19, 2024. A wide range of topics was covered, encompassing PFAS, conceptual site models, recent advances in remediation technologies, climate change and natural disaster management, diffuse pollution, mining, emerging and legacy contaminants, environmental policy and guidance, and risk characterization including bio availability. Extended abstracts from the proceedings are available for review. https://www.dropbox.com/scl/fi/tylmiyje3xegh4xeedsf5/CleanUp-2024-Proceedings-V2-19.9.24.pdf?rlkey=43gess225vzyvrko7ouiyj03t&e=2&st=zwrrfxii&dl=0

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 Remediation and Technology Innovation at adam.michael@epa.gov or (703) 603-9915 with any comments, suggestions, or corrections.

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