Entries for April 16-30, 2025

Market/Commercialization Information

RARITAN BAY SLAG SUPERFUND SITE, OPERABLE UNIT 1 (OU1) -- SEAWALL SECTOR, OLD BRIDGE TOWNSHIP AND SAYREVILLE, MIDDLESEX COUNTY, NEW JERSEY (SRCSGT)
U.S. Army Corps of Engineers (USACE), Kansas City District, Kansas City, MO
Contract Opportunities on SAM.gov W912DQ25SS3001, 2025

This is a sources sought notice for marketing purposes only. The U.S. Army Corps of Engineers, Kansas City District, seeks responses from qualified firms interested in conducting soil and sediment remediation under NAICS code 562910at the Raritan Bay Slag Superfund Site in the Laurence Harbor section of Old Bridge. Remediation of the Superfund Site is being conducted in phases, with this work addressing the Seawall Sector (Areas 1, 2, 3, 4, and 5) and an upland portion of Margaret's Creek Sector (Area 9) that had not been remediated previously. Remediation involves excavation and removal slag, battery casings and associated waste (including miscellaneous demolition debris in the form of concrete and various bricks), and excavation and removal of soils and sediment above the lead remediation cleanup level of 400-mg/kg. The work will also require the design, installation, and removal of approximately 3,700 feet of sheet pile wall, dewatering to facilitate "in-dry" excavations, temporary water treatment system design, installation and start-up, backfill and grading, site restoration including coastal wetland restoration, and reconstruction of the seawall. The project will require coordination with multiple stakeholders, including Federal, State, and Local authorities such as USACE, U.S. Environmental Protection Agency, National Oceanic and Atmospheric Administration, New Jersey Department of Environmental Protection, County of Middlesex, Old Bridge Township, Sayreville Township, Old Bridge Municipal Utilities Authority, and adjacent landowners. Responses are due by 1:00 PM CDT on June 6, 2025.
https://sam.gov/opp/5a196d97a920401ab6e8a819f744f424/view

UMIAT RELEASE INVESTIGATION (SRCSGT)
U.S. Department of Transportation, Federal Aviation Administration, Regional Acquisition Services, Fort Worth, TX
Contract Opportunities on SAM.gov 697DCK-25-R-00353. 2025

This is a sources sought notice for marketing purposes only. The Federal Aviation Administration seeks to solicit statements of interest and capabilities from Small Business Administration (SBA) SEDB 8(a) certified business concerns capable of performing a remedial action and remedial investigation under NAICS code 562910 at the former Umiat Radio Range in Alaska. Generally, the scope will be to delineate the metal- and petroleum-contaminated soil, sediment, and surface water associated with historical FAA activities at two ponds and a former drum site. Work will include the collection of surface water and sediment samples from eight nearby tundra ponds to establish background conditions; analysis of surface water and sediment samples for RCRA Metals (dissolved and total), GRO, RRO, DRO, PAHs, and VOCs by a laboratory that has been approved or certified by the State of Alaska; the calculation of TAH and TAqH concentrations for all surface water samples; and performance of a horizontal and vertical survey of all surface water and soil sample locations, and any other locations deemed to be pertinent to the project. Following the completion of field activities, the sites must be restored to preexisting conditions. No materials or equipment be left at the facility. The field work must occur in the Spring/Summer of 2026. The Umiat Radio Range is not connected to the state's road system and is accessible either by land or helicopter. There is no remaining FAA infrastructure and therefore there are no FAA-imposed access restrictions on the former facility. The project site is, however, located on property owned by the Alaska Department of Transportation and Public Facilities; a Right-of-Entry permit must be obtained by the Contractor. The Contractor must provide transportation for one FAA representative to Umiat whenever the site is accessed by the Contractor or their subcontractor(s). Due to the absence of commercial lodging options, lodging and meals must be provided to the FAA representative by the Contractor throughout the project's duration and be equivalent to the accommodation provided to the Site Superintendent or Field Team Lead. The full statement of work will be issued at Solicitation phase. Responses are due by 2:00 PM CDT on June 9, 2025. https://sam.gov/opp/ae1fb8d6feda445c99681a6852af61fe

RELIEF WELL ENGINEERING WITH GEOPHYSICAL SURVEYING FOR THE GREAT LAKES AND OHIO RIVER DIVISION
US Army Corps of Engineers Engineer Division Great Lakes and Ohio
Contract Opportunities on SAM.gov W9123725RA0003, 2025

The purpose of this notice is to gain knowledge of potentially qualified small business sources under NAICS code 541330 to include Small Business, Small Disadvantaged Business, Certified HUBZone, Woman-Owned, and Service-Disabled Veteran-Owned. Work would occur as assigned to Districts within the U.S. Army Corps of Engineers, Great Lakes and Ohio River Division, which includes the Buffalo, Chicago, Detroit, Huntington, Louisville, Nashville, and Pittsburgh Districts, though will primarily occur through the Huntington District. Contractor shall demonstrate through professional registration, company and personnel resumes, executed examples, and supporting customer feedback documentation the ability to provide engineering support of activities, including foundation pressure relief well engineering; aerial and or ground based geophysical surveying of embankments; foundation and groundwater seepage studies; contaminated soil and groundwater cleanup related to relief wells; and environmental studies and knowledge required related to relief wells, toe drains, and collector systems. Interested contractors should provide a response by COB on June 16, 2025.
https://sam.gov/opp/13cecfae92ff49ac9e0c33cea8d14fc7/view#attachments-links

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Cleanup News

MULTI-YEAR PASSIVE IN SITU TREATMENT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) WITH AN HRX WELL®
Divine, C., J. Wright, A. Baumeister, J. Lang, D. Liles, M. Kladias, M. Lubrecht, D. Ombalski, T. Olechiw, M. Riggle, and B. Grunewald. l Remediation 35(3): e70021(2025)

Results of the first field demonstration of a Horizontal Reactive Treatment Well (HRX Well®) designed to treat PFAS are presented. Based on treatability test results and numerical design modeling, a 645-ft long HRX Well was constructed with removable cartridges containing granular activated carbon for passive PFAS treatment. It has operated continuously with minimal operation and maintenance activity for more than three years. Total PFAS treatment efficiencies ranged from 53% to 74%, resulting in a sustained and average PFAS mass discharge reduction of ~5 mg/day. The HRX Well compares favorably to conventional alternatives. The estimated treatment zone width is ~20 ft, which could be increased by pumping. Multiple HRX Wells could be installed to address a wide treatment zone, and wells could be paired with other technologies in an overall plume treatment strategy. The study highlights the importance of understanding groundwater dynamics and PFAS concentration trends when designing the wells and interpreting results. It also indicates it may be prudent to design most HRX Wells with an active (pumping) configuration option, which adds modest cost, but allows more operational control and increases capture. Results affirm that HRX Wells may be a viable in situ remediation technology for PFAS.

PASSIVE AND SOLAR-POWERED BIOVENTING IMPLEMENTATION TO AUGMENT NATURAL SOURCE ZONE DEPLETION (NSZD) OF PETROLEUM LIGHT NON-AQUEOUS PHASE LIQUIDS (LNAPL) IN THE SUBSURFACE
Wheeler, K. l l DCHWS East 2025 Spring Symposium, 2-4 April, Philadelphia, PA, poster, 2025

This presentation discusses performance monitoring of bioventing to document leading and lagging indicators of remedial progress (i.e., groundwater concentrations, geochemistry, temperature changes, and soil gas composition and concentrations) to support the calculation of associated biodegradation rates at petroleum LNAPL sites. It includes examples from successful passive and solar-powered bioventing applications of how to assess this monitoring data, using dashboards to evaluate O_2/CO_2 ratios, respirometry, as well as soil gas flow modeling and O2 depletion data to document remedial progress and to optimize the bioventing operation to enhance NSZD as an effective remedy for petroleum LNAPL sites.
https://clemson.app.box.com/s/dqi9hpdd3ryiwcsncjchi61txpgxlggj/file/1823414353831?sb=/details

IN-SITU TREATMENT OF A LONG CARBON TETRACHLORIDE AND OTHER CHLORINATED SOLVENT PLUME ASSESSED WITH GROUNDWATER MODELING, TRACERS, MOLECULAR DIAGNOSTIC TOOLS, AND COMPOUND-SPECIFIC ISOTOPE ANALYSIS (CSIA)
Birk, G. l AEHS Foundation 40th Annual International Conference on Soils, Sediments, Water and Energy 21-24 October, Amherst, MA, 35 slides, 2024

A project addressed a 900 ft x 600 ft groundwater plume impacted with carbon tetrachloride (CT) ranging from 4 to > 4,000 mg/L, along with other solvents in the uppermost, relatively thin saturated sand unit at a site in Kansas. The remediation approach consisted of using direct push technology injections (DPT) to distribute the amendment in the subsurface. The injection points formed linear barriers separated by the equivalent of 2 years of groundwater flow. Three permanent wells for large batch soluble-based amendment injections upgradient to the source zone were used to distribute amendments at locations difficult to access via DPT. The approach combines zero-valent iron (ZVI), electron donors, pH buffers, micronutrients, and a chlorinated-methane degrading bioaugmentation culture to sequentially address carbon tetrachloride through ISCR and its breakdown products through anaerobic bioremediation. Performance monitoring tools include a groundwater model coupled to fluorescent tracer injections through the three installed permanent wells. Periodic geochemical groundwater parameters will assess the impact of injectates in aquifer conditions, while qPCR tests in groundwater will be used to quantify *Dehalococcoides Mcartii*, *Dehalobacter*, and key functional genes to determine the evolution of microbial culture capable of dechlorination of constituents of concern. CSIA will target CT, chloroform, dichloromethane, PCE, TCE, cis-DCE, and VC. By tracking the change of carbon isotopic composition (δ13C) caused by either biotic or abiotic processes, the VOC mass destruction process initiated by remediation can be distinguished from co-occurring diluting processes. CSIA was also used as a tool to detect the inhibition of dichloromethane or other incomplete dechlorination processes. Main findings, including results of a baseline and three post-injection groundwater sampling events, are presented. https://s3.amazonaws.com/amz.xcdsystem.com/A51108D5-EA2F-2B6D-01D92AC0F42DCF3B_abstract_File24087/Handout_105_1020021120.pdf

OPTIMIZING AN IN-SITU THERMAL REMEDY VIA PRE-REMEDIAL INVESTIGATION
Grant, S. l AEHS Foundation 40th Annual International Conference on Soils, Sediments, Water and Energy 21-24 October, Amherst, MA, 24 slides, 2024

OPTIMIZING AN IN-SITU THERMAL REMEDY VIA PRE-REMEDIAL INVESTIGATION Grant, S. l AEHS Foundation 40th Annual International Conference on Soils, Sediments, Water and Energy 21-24 October, Amherst, MA, 24 slides, 2024 The ABC One Hour Cleaners Superfund site is contaminated with CVOCs in soil and groundwater. Previous remedial activities included the removal of a septic system and soil vapor extraction. Significant mass remained following the system shutdown, and a more robust remedy was needed. Supplemental investigations supported an in situ thermal remediation (ISTR) design. A pre-remedial investigation (PRI) was conducted utilizing an adaptive management decision model that focused on several objectives: (1) closing existing data gaps including the lateral and vertical extent of source material; (2) establishment of baseline soil and groundwater conditions; (3) verification of the previously estimated shallow treatment area; (4) verification of the transmissive zones within the proposed treatment areas; and (5) confirmation of geotechnical characteristics. Based on the results of the PRI, three primary optimizations of the ISTR were developed. The extent of the originally proposed five thermal treatment zones was refined to ensure full capture of the source area onsite. The proposed depths of the heater wells were extended to provide additional heating, with supplemental steam injection wells added to prevent the influx of cooler groundwater, resulting in inefficient heating. Lastly, a sixth treatment zone was defined to address contamination under the adjacent building, including installing angled heaters in a fan array and a subslab depressurization system to capture generated vapors, allowing the business to remain open during system installation and operation and continued access to the adjacent alleyway. The system is currently operational.
https://s3.amazonaws.com/amz.xcdsystem.com/A51108D5-EA2F-2B6D-01D92AC0F42DCF3B_abstract_File24087/Handout_153_1018032221.2024_AEHS_SDG_ABC_Cleaners.pdf
See Remedial Action Report for more information: https://semspub.epa.gov/work/04/11209585.pdf

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Demonstrations / Feasibility Studies

IN SITU BARRIER FOR PFAS AT MID-ATLANTIC DOD SITE
Seymour, K. l l DCHWS East 2025 Spring Symposium, 2-4 April, Philadelphia, PA, 19 slides, 2025

A pilot colloidal activated carbon (CAC) barrier was installed in a former fire training area to explore the approach's efficacy in cleaning up PFAS-impacted groundwater and test the CAC's distribution in the subsurface. The presentation highlights the modeling to determine the appropriate CAC dosing, the use of passive flux measurement tools to assess PFAS flux and performance, the injections and distribution testing, and the long-term effectiveness of treatment at the downgradient edge of the barrier in both the shallow and deep groundwater. Nearly two years of post-application data are presented, showing a >98% reduction in PFOA and PFOS concentrations. https://mediacdn.guidebook.com/upload/213716/k52aevxmPPkzRR3qHoh0beefcXckgBKMsMPx.pdf

COMPARING ENHANCED NATURAL RECOVERY AND ENHANCED NATURAL RECOVERY WITH ACTIVATED CARBON: A CASE STUDY IN THE LOWER DUWAMISH WATERWAY
Magar, V.S., J.M. Conder, L. Nelis, D. Williston, J. Stern, D. Schuchardt, A. Crowley, P.D. Rude, J. Florer, and J. Flaherty.
Integrated Environmental Assessment and Management vjaf040, 2025

EPA and the Washington Department of Ecology directed a three-year pilot study to determine whether activated carbon ([AC] (Coconut Fine Mesh Activated Carbon graded 200-1,000 µm) would enhance the effectiveness of enhanced natural recovery (ENR+AC) to remediate PCBs in aquatic sediments in the Lower Duwamish Waterway (LDW). Three 1-acre areas were established within the LDW, representing an intertidal area, an area prone to scour, and a subtidal area, where ENR+AC and ENR would be compared. The target ENR and ENR+AC thickness was 15-30 cm with 4% AC in the ENR+AC plots; actual thicknesses across all plots were 15-46 cm, with a mean depth of material across plots that ranged from 24 to 35 cm. ENR and ENR+AC placements were relatively stable, and AC remained stable within the ENR+AC plots throughout the study. Final ENR applications were somewhat thicker than expected, however, benthic community results demonstrated substantial biological activity, including the presence of organisms that burrow deeper than the ENR layer depth. Both treatments performed similarly at plots where the performance could be most accurately assessed. Overall, results indicate that both ENR and ENR+AC were successful in reducing PCB bioavailability under a wide variety of conditions in the LDW. The ENR reduced PCB bioavailability so well that no substantive improvements as a result of adding AC were detected.

EVALUATION OF A PASSIVE APPROACH TO TREAT LARGE, DILUTE CHLORINATED VOC GROUNDWATER PLUMES
Lippincott. D.R. ESTCP Project ER-201629, 2 pp, 2025

This project aimed to demonstrate effective in situ biological treatment of large, dilute cVOC plumes using a sustainable and cost-effective approach. The critical objectives were to determine whether an off-the-grid biosparging system could sustainably and economically deliver gaseous amendments in a biobarrier configuration across a large, dilute plume, stimulating indigenous bacteria to biodegrade target cVOCs, and whether consistent in situ treatment to target levels was feasible. During the project, an oxygen and propane with ammonia cometabolic biosparging system in a barrier configuration was successfully utilized to degrade cVOCs in the plume. This cometabolic bioremediation effort demonstrated that low, yet still above MCL cVOC concentrations in large plumes can be sustainably and cost-effectively treated for cases when attenuation processes are insufficient to protect receptors. Application of the improved methods to treat contaminants may result in significant cost savings when the reduction of cVOCs in a large, dilute groundwater plume is a significant driver of remediation costs.
https://sepub-prod-0001-124733793621-us-gov-west-1.s3.us-gov-west-1.amazonaws.com/s3fs-public/2025-05/ER-201629%20Fact%20Sheet.pdf?VersionId=Wen0kGjZP7sQnfo3Q8JSQsnqxwTjADqE
Final Report: https://sepub-prod-0001-124733793621-us-gov-west-1.s3.us-gov-west-1.amazonaws.com/s3fs-public/2024-02/ER-201629%20Final%20Report.pdf?VersionId=s3eXDGj0uqamSp1wrUmbVFq_lxLpwap
Executive Summary: https://sepub-prod-0001-124733793621-us-gov-west-1.s3.us-gov-west-1.amazonaws.com/s3fs-public/2024-02/ER-201629%20Executive%20Summary.pdf?VersionId=8e9LoQTMV0bu1Co86SMzUIYq7p138FpY

INNOVATIVE IN-SITU PFAS REMEDIATION VIA IN-WELL GROUNDWATER RECIRCULATION AND FOAM FRACTIONATION
Rabah, N. l AEHS Foundation 40th Annual International Conference on Soils, Sediments, Water and Energy 21-24 October, Amherst, MA, 13 slides, 2024

This paper presents the results of the first successful field application of the ART-PFAS technology developed and implemented at a former industrial site in New Jersey. ART-PFAS is a specialized system designed to remove PFAS via in situ groundwater recirculation and foam fractionation/stripping. It integrates proven synergistic in situ remediation processes, including groundwater recirculation, soil flushing/washing, volatilization, and in-well stripping via air sparging and soil vapor extraction (SVE). Air sparging is used in ART-PFAS to generate a PFAS-rich foam that can be recovered with condensate by modifying the SVE system. Groundwater recirculation augments the performance by increasing the time the water is exposed to PFAS partitioning and enhancing soil washing/flushing across the water table and capillary fringe. Air sparging affects groundwater recirculation by providing a hydraulic divide and packer functions. The test demonstrated mass reduction of long-chain and short-chain PFAS with more preferential removal efficiencies of long-chain PFAS. After a few months of operation, PFAS was enriched in the recovered foam/condensate by 100-300 times while only 50 gals of liquid waste were produced after recirculating >500,000 gals of groundwater. PFAS concentrations were reduced by 50%-100% in the test well and by 25%-40% in a nearby monitoring well. PFOA and PFOS concentrations in the test well were reduced from nearly 400 and 1,000 ng/L, respectively, to below NJ and EPA Drinking Water Standards.
https://artinwell.com/assets/pdfs/case-histories/pfas/ART-PFAS-Field-App-of-Innovative-In-Situ-PFAS-Rem-via-In-Well-GW-Recirc-Foam-Fractionation.pdf

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Research

EX SITU TREATMENT OF PFAS-IMPACTED GROUNDWATER USING ION EXCHANGE WITH REGENERATION
Fuller, M.E. SERDP Project ER18-1027, 233 pp, 2024

This project aimed to develop treatment trains for PFAS-contaminated groundwater consisting of ion exchange (IX) using novel resins coupled with sonochemical destruction of PFAS in waste regeneration brine. While the project focused on ion exchange to remove PFOA and PFOS, it also examined the treatment of the broader range of PFAS (shorter- and longer-chain perfluoroalkyl acids and sulfonates) and precursors (fluorotelomer sulfonates). The technical approach consisted of lab experiments to identify and test new IX resins combined with a small-scale field study to demonstrate their effectiveness in removing a broad range of PFAS from groundwater, relative to granular activated carbon. Sonochemical destruction of PFAS in anion exchange regeneration wastes and the potential factors that could impact PFAS destruction were also examined. An Excel-based tool was also developed to guide which media or combination of media would be cost-effective for PFAS removal under various conditions. The main benefits were (1) the development and validation of efficient IX resins and resin systems for removing a broad range of PFAS and precursor compounds from groundwater; (2) the development and testing of resin regeneration waste treatment approaches to destroy accumulated PFAS and precursors in regenerant waste; (3) field pilot testing the treatment train, and; (4) preparing a tool that provides technical and cost guidance for IX resin or GAC treatment based on a given site's PFAS contamination profile and groundwater chemistry.
Final Report: https://sepub-prod-0001-124733793621-us-gov-west-1.s3.us-gov-west-1.amazonaws.com/s3fs-public/2025-05/ER18-1027%20Final%20Report.pdf?VersionId=WUX19sd47WoA0ZR5.Glm45ow1bb1B3qn
Executive Summary: https://sepub-prod-0001-124733793621-us-gov-west-1.s3.us-gov-west-1.amazonaws.com/s3fs-public/2025-05/ER18-1027%20Executive%20Summary.pdf?VersionId=4PvJtqzQ45Q_9Ok99OxxAJbaja4.8hXe
Guidance: https://sepub-prod-0001-124733793621-us-gov-west-1.s3.us-gov-west-1.amazonaws.com/s3fs-public/2025-04/ER18-1027%20Guidance%20Document.pdf?VersionId=_9GO7W22ns2M6zmmpWxw2gw2F5nBD7im

EMERGING PER- AND POLYFLUOROALKYL SUBSTANCES IN TAP WATER FROM THE AMERICAN HEALTHY HOMES SURVEY II

Boettger, J.D., N.M. DeLuca, M.A. Zurek-Ost, K.E. Miller, C. Fuller, K.D. Bradham, P. Ashley, W. Friedman, E.A. Pinzer, D.C. Cox, G. Dewalt, K.K. Isaacs, E.A.C. Hubal, and J.P. McCord.
Environmental Science & Technology 59(5):2686-2698(2025)

A study analyzed 680 tap water samples from the American Healthy Homes Survey II for PFAS using non-targeted analysis (NTA) to expand the range of detectable PFAS. About half of the identified PFAS were found only by NTA, based on detection frequency and relative abundance. The study identified 75 distinct PFAS, including 57 exclusively detected by NTA. The identified PFAS are members of seven structural subclasses differentiated by their head groups and degree of fluorination. Clustering analysis categorized the PFAS into four co-abundance groups dominated by specific PFAS subclasses. One group uniquely identified by NTA contains zwitterionic PFAS and other PFAS transformation products, which are likely associated with AFFF contaminants in a small number of spatially correlated samples. Results help further characterize the scope of exposure to emerging PFAS experienced by the U.S. population via tap water and augment nationwide targeted PFAS monitoring programs. https://pubs.acs.org/doi/epdf/10.1021/acs.est.4c08037?ref=article_openPDF

ANAEROBIC BIODEGRADATION OF PERFLUOROOCTANE SULFONATE (PFOS) AND MICROBIAL COMMUNITY COMPOSITION IN SOIL AMENDED WITH A DECHLORINATING CULTURE AND CHLORINATED SOLVENTS

Lorah, M.M., K. He, L. Blaney, D.M. Akob, C. Harris, A. Tokranov, Z. Hopkins, and B.P. Shedd. l Science of The Total Environment 932:172996(2024)

A study investigated the potential to utilize microbially-mediated reduction (bioreduction) to degrade PFOS and other PFAS by adding a dehalogenating culture, WBC-2, to soil obtained from an AFFF-contaminated site. A substantial decrease in total PFOS mass (soil and water) was observed in microcosms amended with WBC-2 and cVOC co-contaminants (46.4 ± 11.0 % removal) over the 45-day experiment. In contrast, PFOA and 6:2 fluorotelomer sulfonate (6:2 FTS) concentrations did not decrease in the same microcosms. The low or non-detectable concentrations of potential metabolites in full PFAS analyses, including after application of TOP, indicated that defluorination occurred to non-fluorinated compounds or ultrashort-chain PFAS. Additional research on the metabolites and degradation pathways is needed. Population abundances of known dehalorespirers did not change with PFOS removal during the experiment, making their association with PFOS removal unclear. An increased abundance of sulfate reducers in the genus *Desulfosporosinus* (Firmicutes) and *Sulfurospirillum* (Campilobacterota) was observed with PFOS removal, most likely linked to initiation of biodegradation by desulfonation. Results have important implications for the development of in situ bioremediation methods for PFAS and advancing knowledge of natural attenuation processes.

ENHANCING GROUNDWATER REMEDIATION EFFICIENCY THROUGH INTEGRATING PUMP-AND-TREAT SYSTEM AND GROUNDWATER CIRCULATION WELL

Zhang, Z., B. Ran, C. Gong, N. Yan, J. Yang, C. Shen, and Y.-L. Wang.
Process Safety and Environmental Protection 194:1454-1464(2025)

The effectiveness of jointly operated groundwater circulation wells (GCW) and pump-and-treat (P&T) in the remediation of contaminants was examined in a sandbox experiment and numerical simulations. Findings demonstrate that integrating GCW with P&T results in a more effective and dynamic hydraulic regime than the conventional single-technology approach. The jointly operated system demonstrated enhanced efficiency in contaminant capture, with an expanded radius of influence compared to the use of either method alone. The GCW also reduces the size of unsaturated zones created by P&T, enhancing the overall remediation effectiveness. The innovative hybrid approach improves contaminant capture, making it a promising strategy for effective and sustainable groundwater remediation, especially in complex geological environments.

BACKGROUND PFAS CONCENTRATIONS IN SURFACE SOIL OF MASSACHUSETTS AND NORTHERN NEW ENGLAND: REGIONAL AND GLOBAL SOURCE PATTERNS AND REGULATORY RELEVANCE

McIntosh, L., C. Rockwell, S. Olney, L. Campe, R.D. Collins, J.D. Bryant, V. Ward, P. Harring, and J. Occhialini. l Remediation 35(2):e70013(2025)

In this study, surface soil (0-15 cm below grade) was collected from 100 locations at 25 properties across Massachusetts and analyzed for 36 PFAS. PFOS and PFOA were detected in every sample at the highest concentrations relative to other PFAS. PFCAs were more common than PFSAs. PFAS concentrations were also significantly correlated with organic carbon content. No fluorotelomers, perfluoroalkane sulfonamide or sulfonyl substances, per- or polyfluoroalkyl ether carboxylic acids, or chloropolyfluoroalkyl ether sulfonic acids were detected. A comparison with results from Maine, Vermont, and New Hampshire exhibited a consistent pattern. PFOS and PFOA are the most commonly detected PFAS and are found at the highest concentrations. The predominant PFAS present and their concentrations as a function of chain length are different from regional industrial sources and are more like deposition estimates resulting from global emissions, including from outside North America, and atmospheric precursor degradation. Anthropogenic background concentrations may exceed soil cleanup standards based on leaching to groundwater, resulting in investigation and remediation liabilities for property owners even though no onsite release has occurred. Given the ubiquity of PFAS today, soil anthropogenic background concentrations should be considered during the promulgation of cleanup standards.

SOURCES OF POLYCHLORINATED DIBENZO-P-DIOXINS AND -FURANS TO SEDIMENT IN THE NEWTOWN CREEK SUPERFUND SITE

Chitsaz, M., M. Al Hello, D.R. Burris, K.L. Francisco, and L.A. Rodenburg.
Science of The Total Environment 958:177771(2025)

Sources of polychlorinated dibenzo-p-dioxins and -furans (PCDD/Fs) to the sediment of Newtown Creek were investigated using Positive Matrix Factorization (PMF) to analyze two data sets containing data on concentrations of PCDD/Fs and PCDD/Fs plus PCBs. The PCDD/F data set generated eight factors that did not help identify PCDD/F sources. The combined PCDD/F plus PCB data set generated eleven factors, many of which represented Aroclors. Based on its spatial distribution, the primary source of PCDD/F-related toxic equivalency quotient (TEQ) in the sediment (accounting for 53% of total TEQ) may be related to a facility that performed smelting and refining of metals. Aroclors appear to be responsible for about 20% of the total TEQ. The analysis revealed two additional secondary sources of PCDD/Fs to Newtown Creek sediment: the East River (3% of TEQ) and Combined Sewer Outfalls ([CSOs], 0.5% of TEQ). The East River was responsible for most of the mass of 2,3,7,8-tetrachloro dibenzo-p-dioxin (TCDD) in the sediment, presumably because it transports TCDD-laden sediment from the Passaic River into Newtown Creek. CSOs were proportionately more important in surface sediments. Adding PCBs to the data matrix appears to increase the ability of the PMF analysis to identify both primary (Aroclors) and secondary (CSOs, East River) PCDD/F sources, but it is unclear whether it may overstate the fraction of PCDD/Fs arising from Aroclors.

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General News

USING ADVECTIVE TRANSPORT PHENOMENA TO ACCOUNT FOR UNCERTAINTY OF CONDUCTIVITY IN MONITORING DESIGN

de Lange, W.J. l Groundwater 63(3):319-325(2025)

Advective transport phenomena allow for the calculation of the longitudinal and vertical growth of a contaminant plume along the flow path using simple analytic expressions, based solely on the log conductivity variance and the horizontal and vertical characteristic lengths that describe the aquifer heterogeneity. In previous work, the calculated plume growth was verified in 12 large-scale experiments worldwide. The method is used to investigate the relationship between uncertainty in the conductivity variation and the plume growth by calculating the spreading of water particles in a vertical section along the traveled path. In a very heterogeneous aquifer, virtually all water particles spread forward about equally, generating a limited forward growth compared to the traveled distance, which is not sensitive to uncertainty in the conductivity. In a nearly homogenous aquifer, only a portion of the water particles are spread forward, which is repeated at different depths along the traveled path, causing significant uncertainty in the position and length of the plume growth. Thus, an observation network should be designed more densely in a homogeneous aquifer than in a heterogeneous one. A calculation tool is provided. https://ngwa.onlinelibrary.wiley.com/doi/epdf/10.1111/gwat.13467

HOW DO NOVEL PFAS SORBENTS FIT INTO CURRENT ENGINEERING PARADIGM?

Burkhardt, J., T.F. Speth, S. Gorzelnik, A.S. Gorzalski, O. Coronell, A.R. El-Khattabi, and M. Ateia. l ACS ES&T Engineering 5(4):830-838(2025)

This article provides insights into potential advantages and challenges by exploring the current state of novel PFAS sorbents within the broader context of existing technologies. Novel sorbents bring promising benefits, including enhanced selectivity, rapid kinetics, and flexibility for different PFAS chemistries, particularly in challenging matrices such as wastewater. Despite their advantages, significant work remains to refine these materials for large-scale applications, including addressing scalability, cost-effectiveness, fouling resistance, and regulatory certification hurdles. By examining key factors for both utilities and novel sorbent developers, this perspective aims to guide informed decisions that balance immediate regulatory compliance with long-term adaptability.

ADVANCING GROUNDWATER REMEDIATION: EFFICACY OF SLOW-RELEASE PERMANGANATE GELS (SRPG) IN TREATING CONTAMINANT PLUMES

Egware, A.E. l Current Journal of Applied Science and Technology 44(2):124-132(2025)

Experimental and modeling studies were reviewed to assess the oxidation capacity, release kinetics, and field applicability of SRPG to remediate groundwater. Literature from 2019 to 2024 was obtained from several databases, including Google Scholar, PubMed, Scopus, and Web of Science, focusing on the latest techniques and challenges in the field. Inclusion criteria ensured that the selected articles were peer-reviewed, discussing mechanisms, hydrogeologic applications, and contaminant mitigation involving SRPG. Experimental setup, numerical models, and field data were considered to assess performance and scalability for various uses of SRPG. The review identified five effective studies in reducing contaminant concentrations in groundwater. Key factors for remediation success were increased oxidation capacity, longer release kinetics, and improved spatial distribution. One notable finding was a 75% reduction in TCE concentrations within six months of SRPG application in a pilot-scale study. Field applications reported significant contaminant reduction in heterogeneous aquifer systems, supporting the scalability of SRPG technology. Future studies are needed to optimize gel formulations with respect to their long-term environmental impacts and the ability to biodegrade under environmental conditions, contributing to globally sustainable water resource management. https://journalcjast.com/index.php/CJAST/article/view/4491/9013

RECENT ADVANCES ON DIOXIN AND FURAN (DIBENZOFURAN) BASED POLLUTANTS FROM ANALYTICAL, ENVIRONMENTAL, AND HEALTH PERSPECTIVES

Kanan, S., F. Samara, L. Dronjak, A. Mahasneh, M. Moyet, K. Obeideen, and V. Gopal.
Chemosphere 372:144120(2025)

A comprehensive review highlights recent findings of dioxin and furan pollution. It focuses on major environmental and health aspects associated with exposure to dioxin and its derivatives by assessing the routes of exposure, toxicity, and modes of action. VOSviewer was used to understand the research interest within the scientific community in the study of dioxins and furans. Various strategies are discussed, including remediation, extraction, and analysis methods, as well as protocols required to improve compound filtration and mineralization to enhance the efficiency of environmental cleanup processes.

WORKSHOP 05: ADVANCES IN APPLICATIONS, TECHNIQUES, AND INTERPRETATION IN THE FIELD OF ENVIRONMENTAL FORENSICS

Philip, P. l 34th Annual International Conference on Soil, Water, Energy, and Air, 17-20 March, San Diego, CA, 195 slides, 2025

This workshop discusses the evolution of forensic fingerprinting techniques and their applications to environmental forensic problems as well as the integration of historical product information, site histories, and other information. The ultimate goal is to provide a comprehensive picture of what is required to be an environmental forensic expert or scientist. https://s3.amazonaws.com/amz.xcdsystem.com/A51108D5-FA2E-2B6D-01D92AC0E42DCE3B_abstract_File25469/PresentationPDF_106_0318081927.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 Remediation and Technology Innovation at adam.michael@epa.gov or (703) 603-9915 with any comments, suggestions, or corrections.

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