Entries for April 1-15, 2026

Market/Commercialization Information

PRESOLICITATION NOTICE; FA890326R0007 - ENVIRONMENTAL CONSTRUCTION OPTIMIZATION SERVICES (ECOS) (PRESOL)
U.S. Department of the Air Force, Air Force Materiel Command, AF Installation and Missions Support Center, JBSA Lackland, TX
Contract Opportunities on SAM.gov FA890326R0007A, 2026

When this solicitation is released, it will be competed as a total small business set-aside under NAICS code 562910. The 772nd Enterprise Sourcing Squadron PKB Flight intends to issue a Request for Proposal (RFP) for the Environmental Construction Optimization Services (ECOS) Multiple Award Task Order Contract (MATOC) / Indefinite-Delivery/Indefinite-Quantity (IDIQ) contract. This requirement is for comprehensive environmental services to support mission requirements. The broad scope of work encompasses environmental planning, investigation, remediation, construction, and compliance activities. The Government anticipates awarding multiple contracts under this solicitation. The total ceiling for this IDIQ contract will be $3.5 billion with a 5-year base period and one 3-year option period. There is no solicitation at this time. https://sam.gov/workspace/contract/opp/8a0862907b754cd2b1d07757f362918d/view

F--NAVAJO AREA - ABANDONED MINES RESPONSE AND CONSTRUCTION SERVICES
Environmental Protection Agency, Region 9
Contract Opportunities on SAM.gov 68HE0926R0006, 2026

The purpose of this Pre-Solicitation Notice Amendment is to incorporate the updated Industry Day Flyer. The primary hazardous substance on all the sites referenced in the requirement's Statement of Work (SOW) is radiological mine and mine-related waste; therefore, a significant knowledge base of radiological material handling, environmental data interpretation, and data collection will be required to perform the activities within this SOW. The Contractor shall provide clean-up, response, and construction services to the U.S. EPA, primarily at former uranium mining-related sites located within or nearby the Navajo Nation and the Grants Mining District in New Mexico in U.S. EPA Regions 6 and 9. EPA expects to make an award for this requirement by September 1, 2026. A pre-proposal Industry Day/Conference amongst the U.S. EPA and Potential Offerors is anticipated to occur approximately 1 week after the Request For Proposals is posted on FEDCONNECT. Conference will be held virtually via Microsoft Teams and wll include site walks at select mines. Attendees will have the opportunity to discuss technical components and opportunities related to upcoming 5-year AMRCS II requirement. https://sam.gov/workspace/contract/opp/5bf7c3b84524453db88b15e5c5ff341c/view

FY26 ENVIRONMENTAL REMEDIATION MATOC
US Army Corps of Engineers Engineer Division North Atlantic
Contract Opportunities on SAM.gov W912GB26RA021, 2026

The U.S. Army Corps of Engineers, Europe District, requests proposals from qualified firms interested in performing work in support of environmental surveillance and remediation services under NAICS code 562910. Under this planned contract, the Contractor shall provide all labor, supervision, transportation, supplies, vehicles, tools, materials, equipment, and incidental services required to execute and document results of environmental remediation projects at DoD facilities. The type of work to be performed under this contract shall include but is not limited to: (1) Surveys, Assessments, and Plans, (2) Studies and Reports, (3) In-situ/Ex-situ Cleanup, and (4) Other Mitigation and Environmental Services. The proposed contract may be used to support the U.S. Army Europe Installations and/or other U. S. Government Agency requirements in Germany and BENELUX. Small and Disadvantaged Business requirements are waived for this project due to its location being OCONUS. The contract will consist of a five-year base period. The contemplated value is $45,000,000.00 to be shared across the contract pool. Offers are due by 5:00 AM EST on June 8, 2026. https://sam.gov/workspace/contract/opp/7aaedf679f9e4af3985594cd29f03b5a/view

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Cleanup News

A CASE STUDY: THE USE OF CHEMICAL AND BIOLOGICAL TECHNIQUES TO REMEDIATE A CVOC PLUME AT A FORMER LANDFILL
Davidson, M.A. | RemTech East, 8-10 April, Ottawa, Canada, 26 slides, 2026

This case study explores the importance of high-resolution delineation of cVOC contamination in groundwater in a leaky confined aquifer with silt lenses; the performance of in situ injections and delivery of both chemical and biological remedial agents into this aquifer to treat the cVOC plume hot spots; and the supplementation of a Dhc population to treat the groundwater cVOC plume at large. Modeling a high-resolution spatial-temporal dataset in three-dimensions showed the importance of contaminant delineation at the start of the remedial process. The case study demonstrated that in situ chemical and biological remedial agents can effectively treat cVOC source zones, while in situ injections of biological treatments alone can be a more cost-effective means of treating the tail end of the cVOC plume. *Download presentation at* https://esaa.org/wp-content/uploads/2026/05/Davidson_Mitchell_RemTechE_2026-Mitchell-Davidson.pptx

CONVERTING PFAS-IMPACTED LANDFILL LEACHATE WASTE FROM A LIQUID TO A SOLID: USING FULL-SCALE FOAM FRACTIONATION AND MEDIA SUPERLOADING TO MINIMIZE WASTE AND REDUCE RISK
Newman, P. | RemTech East, 8-10 April, Ottawa, Canada, 17 slides, 2026

A combined system of foam fractionation on landfill leachate and Superloading adsorptive media treatment on the concentrated liquid waste to convert the foam fractionate liquid to a solid waste was designed to assist a landfill in the cost-effective treatment of PFAS. The foam fractionation and Superloading test design progressed from the pilot scale to a full-scale design and installation, with 1.5 years of operational data. The system operates with lead-lag Foam X-3000 foam fractionators, which were designed and implemented for this site. Treatment goals include the removal of 75% of PFAS mass, with the proportion of PFAS being https://esaa.org/wp-content/uploads/2026/05/2026-RemTech-East-Newman-Foam-Fractionation-Final-Paul-Newman.pptx

BEDROCK INJECTIONS - A SUCCESS STORY BUILT ON CHAPTERS OF FAILURE
Lingwood, S. | RemTech East, 8-10 April, Ottawa, Canada, 20 slides, 2026

This presentation outlines a case study of remedial injection challenges and ultimate success in shale bedrock beneath a large commercial mall in southern Ontario, Canada, impacted by commingled CVOC plumes from historical dry cleaning operations affecting both overburden and a complex sequence of weathered, competent, and fractured shale. The project narrative follows an iterative path of initial program design, geophysical testing, injection failures, redesigns, and mounting frustration, followed by adaptation, innovation, and collaboration that ultimately led to a successful remedial strategy. Download presentation at https://esaa.org/wp-content/uploads/2026/05/RemTechEast-BedrockInj-Slingwood-Apr2026-Samuel-Lingwood-1.pptx

WYCKOFF/EAGLE HARBOR SUPERFUND SITE BAINBRIDGE ISLAND, WASHINGTON
Migdal, W. | DCHWS West 2025 Winter Symposium, 26-28 January, Denver, CO, 16 slides, 2026

The Wyckoff/Eagle Harbor Superfund site is a complex remediation project involving historical creosote contamination. This project included demolishing an existing treatment system, abandoning 69 monitoring and extraction wells, installing 16 new monitoring and extraction wells and one deep fresh water well, excavating 9,000 bank yd^3 of contaminated soil, removing 5,760 ft^2 of steel sheet pile, and managing, transporting, and disposing of construction debris and hazardous waste. The project also involved demolishing two small buildings, installing eight portable extraction well pump skids, upgrading the existing groundwater treatment plant, updating electrical controls, installing wireless controls and transducers, and excavating 600 linear ft of utility trenches. Remote technology, including a site camera, was installed at the site to allow real-time viewing of the site activities and to provide digital archives of activities performed. Key lessons learned during the project:

1. A dedicated field and management staff is critical for large complex projects.
2. Establish effective communication channels.
3. Establish transparency and trust with all stakeholders.
4. Project collaboration leads to innovation.
5. Shared values/vision are critical to set the tone for the project.

https://mediacdn.guidebook.com/upload/213718/xDJRrAHD9ApPUn9gpDbRPlxpYu6Te18bjMeX.pdf

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Demonstrations / Feasibility Studies

DETERMINING THE EFFECTIVENESS OF FREQUENCY DOMAIN ELECTROMAGNETIC AND GROUND PENETRATING RADAR SURVEYING TECHNIQUES IN DETERMINING THE EXTENTS OF BURIED WASTE IN SMALL TRENCH-AND-FILL WASTE DISPOSAL SITES
McKay, G. | RemTech East, 8-10 April, Ottawa, Canada, 13 slides, 2026

A study aimed to delineate buried waste at trench-and-fill style landfills in Northern Ontario using electromagnetics (EM) and ground-penetrating radar (GPR). An EM survey was conducted at each site using an EM-31 MK2, and a GPR survey was conducted using a Noggin 250 SmartCart with a DVL-500 data logger. The EM31-MK2 accurately determined the lateral extents of buried waste compared to the results of the test-pitting program. The accurate delineation of buried waste, combined with the maneuverability and ease-of-use of the EM-31 MK2, makes it an ideal tool for lateral waste delineation in small landfilling sites. The Noggin-250 SmartCart was able to delineate the edges and top of buried waste in some instances, but not consistently. The Noggin-250 SmartCart was also difficult to use over rugged terrain. Download presentation at https://esaa.org/wp-content/uploads/2026/05/RemtechPresentation-GregMcKay-Gregory-McKay.pptx

BIOASH-BASED STABILIZATION/SOLIDIFICATION FOR HEAVY METAL(OID) SOIL REMEDIATION: A CASE STUDY IN NORTHERN SWEDEN
Khasevani, S.G., I. Carabante, J. Bjuhr, and L. Andreas.
Materials 19(4):790(2026

A bioash-cement composite binder was evaluated as a low-cement stabilization material for metal-contaminated soils, with emphasis on mechanical performance and long-term leaching behavior under field conditions. Two fine soil fractions from the Nasudden area (Skelleftea, Sweden), classified as hazardous (HS) and non-hazardous (NHS), were first treated in lab trials to optimize binder composition. An optimum formulation containing 35 wt.% bioash and 5 wt.% cement (dry basis, relative to soil) improved unconfined compressive strength (UCS) to 696 kPa (HS) and 479 kPa (NHS) after 28 days and reduced Zn, Cd, Pb, and Co leaching. Arsenic immobilization improved in HS but decreased in NHS, while Cu and Ni leaching increased, consistent with elevated pH and dissolved organic carbon promoting soluble complexation. The optimized binder was then applied to a pilot soil and validated at pilot scale by treating 100 tonnes of soil and constructing a 2 m high noise barrier. Parallel lab tests on the pilot soil yielded UCS values of 1000 kPa and confirmed effective Zn and Cd retention, with generally good Pb stabilization, while As remained the most mobile element across soil types. Two-year field monitoring showed decreasing leachate concentrations of As, Cu, Ni, Pb, and Zn over time; field samples exhibited improved Cu and Ni retention compared with lab results, suggesting progressive aging effects such as carbonation and mineral transformations. Results demonstrate that bioash-cement binders can produce mechanically stable treated materials suitable for low-load applications while reducing cement demand; however, performance is strongly controlled by soil-specific chemistry and field execution (mixing and compaction), and further binder optimization is required to address arsenic mobility. https://www.mdpi.com/1996-1944/19/4/790

SILICONE-FOAM PASSIVE AIR SAMPLERS FOR COMBINED TARGET AND NONTARGET CHEMICAL PROFILING AND TOXICITY ASSESSMENT OF AIRBORNE EXPOSOMES
Sunyer-Caldu, A., H. Xie, B. Bonnefille, F. Raptopoulou, E. Pesquet, M.B. Rian, D. Schlesinger, M. Norman, Y. June Jeon, B. Kim, S.-B. Lee, J. Eun Lee, J. Froment, S. Papazian, and J.W. Martin.
Environmental Science & Technology 60(7):5628-5644(2026)

Polydimethylsiloxane (PDMS) foam or silicone foam was previously shown to be capable of being synthesized for passive air sampling, enabling simple and cost-effective nontarget chemical profiling of indoor air. In this study, expanded applications, indoors and outdoors, were demonstrated with commercial PDMS-foam, including for wide-scope target analysis of >220 priority substances by quantitative LC-HRMS and GC-HRMS, microscopic characterization and nontarget profiling of accumulated fine particles, and effect-guided discovery of harmful substances, combining toxicological data with nontarget analysis in silico. Median method quantification limits were 0.12 ng/mL, 90% of target analytes had absolute recoveries between 70 and 130%, and

hazardous substances were discovered, including ethylene glycols, insecticides, and UV filters. Microscopy revealed the accumulation of abundant fine particles, and the automated characterization of the fluorescent fraction revealed that most were <4 µm. Extracts from outdoor samples reduced human lung cell viability, and multivariate modeling flagged families of potentially toxic substances in a virtual effect-directed analysis. PDMS-foam disks require field calibration to determine their linear sampling rate(s), but current results and applications establish PDMS-foam as a multimodal passive sampler, enabling integrated chemical quantitation, toxicological analysis, and molecular discovery in air.

SEMI-QUANTITATIVE DIRECT-PUSH DATA CAN IMPROVE CONTAMINANT DELINEATION AND MASS DISCHARGE IN GROUNDWATER

Bollingtoft, A., W. Nowak, P.L. Bjerg, G. Lilbæk, A.G. Christensen, and M. Troldborg.
Groundwater 64(2):189-201(2026)

This study introduces a probabilistic censoring method that enhances geostatistical interpolation by incorporating comparably inexpensive, high-resolution, but semi-quantitative data collected from direct push-probes in the subsurface. The method converts halogen-specific detector signals into binary presence-absence indicators, which are interpolated using indicator kriging to generate a probability field of contaminant distribution. The probability field is then used to censor a spatial concentration field derived from traditional groundwater sampling, retaining interpolated concentration values only in areas where contamination is likely. The method was applied to a site contaminated with chlorinated solvents using two datasets with different sampling densities. Results using the new method show that plume fringes became more clearly defined and the total area with low concentrations (<10 µg/L) increased by 41-85%. CMD estimates were reduced by 13-18%, while relative uncertainty remained largely unchanged. The method integrates with traditional interpolation methods, and the censoring workflow can be applied to other forms of direct-push data. As such, the framework offers a useful method for incorporating semi-quantitative field measurements into concentration interpolation and CMD estimation at contaminated sites.

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Research

MXENE-BASED NANOCONFINED ION CHANNELS FOR ULTRATRACE DETECTION OF SHORT-CHAIN PER- AND POLYFLUOROALKYL SUBSTANCE TRIFLUOROMETHANESULFONIC ACID AND ITS ON-SITE APPLICATION

Xiao, J., X. Xiong, Y. Wu, L. Bu, J. Luo, and S. Zhou.
Environmental Science & Technology 60(12):9521-9529(2026)

A nanoconfined microenvironment was designed by intercalating 4-trifluoromethy-benzylammonium bromide into MXene (MX/CF3BZA) to construct a highly selective channel for the detection of trifluoromethanesulfonic acid (TFMS), a widespread and highly persistent member of the ultrashort-chain PFAS family. The resulting MX/CF3BZA-based ion-selective electrodes (ISEs) achieve remarkable performance, exhibiting an ultralow detection limit (1.2×10^{1} M), which is over 1×104-fold lower than that of conventional commercial ISEs, 17-fold enhancement in selectivity (K_{ij} ~ 7×10^{-3}), and near-Nernstian sensitivity of 56.37 mV/decade. Quartz crystal microbalance measurements directly corroborate this superior performance, showing a 6.4-fold stronger affinity of MX/CF3BZA for TFMS compared with pristine MXene. Density functional theory calculations reveal that the CF3BZA modification creates a unique nanoconfined environment that integrates synergistic F-F, electrostatic, and anion-π interactions, reducing the permeation energy barrier for TFMS by 16.71 kcal/mol. The ISE was integrated into a smartphone-based platform, demonstrating its practical application for onsite TFMS detection.

PFAS QUANTITATION WITH DIFFUSIVE GRADIENTS IN THIN-FILM PASSIVE SAMPLERS: CAPTURING TIME-WEIGHTED AVERAGE CONCENTRATIONS AROUND MAXIMUM CONTAMINANT LEVELS TO FACILITATE COMPLIANCE

Harris, B.J., S.D. Hodges, D.G. Wahman, L.M. Haupert, J.R. Chimka, and J.L. Fairey.
Water Research 300:125918(2026)

Diffusive gradients in thin-films (DGT) passive sampler gel layer diffusion coefficients (D_{Gel}) ± 95% confidence intervals (CIs) were determined for 32 PFAS using two-compartment diffusion cell tests analyzed with a non-steady-state finite difference model (FDM). This model was previously shown to produce D_{Gel} estimates with less error than traditional methods relying on a pseudo-steady-state flux assumption. For each PFAS, the FDM also determined the normalized weighted sum of squared errors (WSSE×n^{-1}), a goodness-of-fit measure. Eleven PFAS had adequate FDM fits (WSSE×n^{-1}< 0.03), and D_{Gel} ± 95% CIs decreased with increasing molecular weight (MW) from 7.1 to 5.1 (± 0.1-0.6) × 10^{-6} cm^2/s. For the other 21 PFAS, linear regression models (D_{Gel} vs. MW; R^2 ≥ 0.967) were used to estimate D_{Gel} ± 95% CIs from 3.4 to 7.6 (± 0.2-1.0) × 10^{-6} cm^2/s. Compared to their free water diffusivities, D_{Gel} values differed by a median of 6.5% and first and third quartiles of 4.5 and 8.7%, respectively. Error in D_{Gel} was propagated into C_{DGT} for 5-36-day lab-scale DGT deployments, in which C_{DGT} ± 95% CIs for 20-31 of the 32 PFAS were indistinguishable from grab samples (sign test; α = 0.05). DGTs accurately captured time-weighted average PFAS aqueous phase concentrations at ~1, 10, 100, and 200 ng/L.

ACID TAR LAGOON REMEDIATION II: LONG-TERM LEACHING AND GEOCHEMISTRY OF STABILIZATION/SOLIDIFICATION MIX DESIGNS

Grubb, D.G., D.R.V. Berggren, E.K. Helbling, and B.K. Schroth.
Remediation 36(2):e70062(2026)

A U.S. project-based treatability study focused on the long-term leaching of benzene and metals from soil surrogates containing 20% (S2X) or 40% (S4X) acid tar by volume (where X denotes the testing phase) and their stabilization/solidification (S/S) mix designs (M2X or M4X) formed with grouts of powdered ladle slag (PLS), a 60/40 (w/w) blend of Type IL Portland Cement, and Grade 120 NewCem slag cement, and, in some mixes, bentonite. Long-term semi-dynamic leaching tests modified (M) for use with hydrocarbons (EPA 1315M) were performed on S/S-treated soil surrogates cured for 28 days. Percent leaching reductions (%LRs) were calculated by comparing quasi-steady-state benzene concentrations from EPA 1315M to the effective solubility of benzene in the untreated soil surrogates (318 mg/L for S22; 406 mg/L for S42). Minimum %LR values of 93.7% and 92.8% were observed for M22 mixes tested with and without 0.5% B, respectively. Parallel testing was conducted using freshly mixed (FM) M22 materials placed in a specialized extractor, where benzene leached into an overlying water cap beneath a continuously exchanged headspace over 91 days. The mass transfer rates from the FM tests compared very well with those from the EPA 1315M tests beginning around day 35, coinciding with the end of the startup period for the 28-day cured samples. Strong data agreement validated the accuracy and effectiveness of the polydimethylsiloxane liner used in the EPA 1315M test. The corresponding EPA 1315M leaching of most trace heavy metals was at or below their respective method detection limits for all leaching intervals for all mix designs. Cd, Se, and Zn showed similar performance with a few outliers. Ba concentrations were between 20 and 100 µg/L. Mo and V concentrations from the pH-dependent leaching (EPA 1313) test never exceeded 10 µg/L and were up to 100 times lower than those from the untreated soil surrogates at the same pH. After the 63-day EPA 1315M test, the unconfined compressive strength of the test samples was at least 689 kPa (100 lb/in^2) greater than their 28-day values.

PRELIMINARY EVALUATION OF IN SITU CHEMICAL OXIDATION EFFECTS ON SOIL CARBON DIOXIDE EMISSION IN A SOIL SLURRY SYSTEM

Wang, W.-J. and C. Liang. | Remediation 36(2):e70064(2026)

A study assessed the effects of ISCO on soil CO_2 emission rates and total bacterial counts by evaluating hydrogen peroxide (HP), sodium persulfate (SPS), and potassium permanganate (PM), alone and combined with various activation methods. CO_2 emission rates from the soil slurry system were measured using a closed static chamber method and expressed in CO_2/gds/h. Under stable conditions, soil CO_2 emission rates were ranked as follows: SPS groups (2.0~4.0) > PM group (1.9-3.1) > HP groups (0.6-1.8) ≈ original soil (0.4-1.0), while total soil bacterial counts (CFU/gds) ranked as: PM group (~107) > HP groups (~106) > original soil (~5.0 × 106) > SPS groups (~104-106). Most oxidant activation treatments led to higher CO_2 emission rates and soil bacterial counts, except under alkaline activation. Findings demonstrate the influence of different ISCO processes on soil CO2 emissions and offer a baseline for emission rates during ISCO remediation.

SYSTEMATIC SCREENING OF AQUEOUS FILM-FORMING FOAM (AFFF)-RELATED EMERGING PER- AND POLYFLUOROALKYL SUBSTANCES IN A FIREFIGHTING TRAINING SITE AND SURROUNDING MULTIMEDIA IN CHINA

Zhang, X., B. Qiao, Y. Zhang, T. Zhao, B. Fang, Y. Zhou, M. An, Y. Yao, H. Chen, and H. Sun.
Journal of Hazardous Materials 503:141244(2026)

Multimedia samples, including air, wastewater/river water, soil/sediments, herbaceous plants, and tree bark/leaves, were collected from a typical firefighting site in China. An integrated screening method tailored for AFFF-related PFAS efficiently identified PFAS across multiple media, comprehensively characterizing their contamination profiles in both atmospheric and terrestrial compartments. In total, 122 PFAS in 62 classes were detected. Notably, 18 AFFF-related PFAS were reported for the first time in environmental media, 10 of which were exclusively detectable through the diagnostic fragment-based screening strategy, underscoring the critical role of this strategy in uncovering structurally unknown PFAS. The highest PFAS diversity (113 compounds) was observed in herbaceous plant systems. Air samples contained 51 PFAS, dominated by anionic fluorotelomer-based PFAS and sulfonamide derivatives. A total of 37 and 38 PFAS were identified in tree bark and leaves, respectively, showing a 76% overlap with airborne PFAS profiles. Findings establish firefighting-derived PFAS as an important source of atmospheric contamination, highlighting a critical knowledge gap that warrants further investigation.
https://www.sciencedirect.com/science/article/pii/S0304389426002220/pdfft?md5=fc16fcadb4771793c12b9294ad4e4277&pid=1-s2.0-S0304389426002220-main.pdf

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General News

PRACTICAL FRAMEWORK FOR MANAGING PFAS IN WASTEWATER TREATMENT PLANTS: INTEGRATING PRE-TREATMENT AND IN-PLANT UPGRADES FOR SUSTAINABLE PFAS REDUCTION

Modiri, M., P.C. Sasi, L.S. Lee, and J. Norton. | Remediation 36(2):e70063(2026)

This perspective draws on recent full-scale monitoring studies, fluorine mass-balance analyses, and statistical evaluation of nationwide data sets to demonstrate that treatment processes compress influent PFAS variability into narrow effluent and biosolids distributions, erasing source fingerprints while redistributing rather than removing mass. The observations motivate a management approach centered on PFAS mass balance rather than end-of-pipe concentration control. A practical, eight-step decision framework is proposed that integrates three tiers of action: (1) source identification, classification of "low-strength," " medium-strength, " and " high-strength" influent streams, and deployment of high-leverage pre-treatment; (2) targeted in-plant controls focused on enrichment points such as foam, aerosols, and sidestreams, with polishing reserved for clean matrices where media exhaustion and residuals can be managed; and (3) residuals strategies that address PFAS in biosolids, concentrated liquids, and air-pollution-control byproducts through destruction or stabilization. The framework embeds conceptual PFAS flux diagrams, explicit consideration of regulatory and permitting constraints, and iterative triple bottom line evaluation to compare treatment trains based on net mass reduction, cross-media trade-offs, life-cycle cost, and community acceptability. The integrated model provides utilities with a structured pathway from diagnosis to implementation, helping avoid stranded investments in low-leverage technologies and supporting PFAS management strategies that are technically defensible, regulatorily viable, and aligned with long-term environmental and public health protection.

INTEGRATING ANALYTICAL SOLUTIONS AND U-NET MODEL FOR PREDICTING GROUNDWATER CONTAMINANT PLUMES IN PUMP-AND-TREAT SYSTEMS

Song, X., I. Demirkanli, Z. Hou, X. Lin, M. Karanovic, M. Tonkin, D. Appriou, and R. Mackley.
Advances in Water Resources 202:105002(2025)

A novel approach that integrates analytical solutions for groundwater dynamics with the U-Net deep learning framework is introduced to predict groundwater contaminant plume migration under dynamic pumping conditions. By incorporating the Thiem equation into the input preprocessing, the U-Net model transforms sparse well data into a continuous spatial field that captures the hydraulic impacts of pumping activities. This integration enables the model to leverage both deep learning capabilities and classical physics-based groundwater theories, enhancing prediction accuracy and computational efficiency. For example, in 2D synthetic cases, integrating analytical solutions reduced the root mean squared error (RMSE) from 2.76 µg/L to 0.7 µg/L. In a complex 3D heterogeneous model of the Hanford Site's 200 West P&T facility, the model completed a 12-year simulation in just 600 ms on a single CPU core, achieving an accumulative RMSE of https://www.sciencedirect.com/science/article/pii/S0309170825001162/pdfft?md5=85822b78bc54ffc8ae8397fa14a3632b&pid=1-s2.0-S0309170825001162-main.pdf

ENHANCING HEAVY METAL REMOVAL USING NOVEL MEDIA SOLUTIONS

Boussoufa, I. | SMART Remediation, 29 January, Toronto, 44 slides, 2026

This presentation introduces advanced treatment methodologies for the removal of heavy metals, with a focus on arsenic, lead, uranium, and mercury. Capabilities of the Cleanit media, a novel iron-based media that efficiently removes lead and arsenic via adsorption and precipitation processes, are presented. The effectiveness of Cleanit-LC in removing toxic heavy metals to meet ultra-low discharge limits is demonstrated, showcasing its potential to significantly reduce environmental impact without altering pH levels, thus promoting cleaner industrial practices at a lower cost than specialized ion exchange resin. The presentation also covers ChemSorb ML, an innovative and versatile amendment for mercury removal. ChemSorb ML chemically binds various

forms of mercury, including elemental, ionic, and methylmercury, achieving reductions of leachable mercury by > 99% and lowering concentrations to ppt levels, making it an effective solution for stringent compliance requirements. Case studies and performance data are provided to illustrate the practical applications and benefits of these media in real-world scenarios, underscoring their effectiveness in reducing operational costs and enhancing compliance with environmental regulations.
https://smartremediation.com/wp-content/uploads/2026/03/SMART-Vancouver_Calgary-2026-%E2%80%93-Imane-Boussoufa.pdf

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