Technology Innovation News Survey

Entries for March 1-15, 2024

Market/Commercialization Information

OPTIMIZED REMEDIATION CONTRACT (ORC) AT VANDENBERG SFB (VSFB). THIS REMEDIATION WILL INVOLVE INSTALLATION RESTORATION PROGRAM (IRP) AND MILITARY MUNITIONS RESPONSE PROGRAM (MMRP) SITES BASE WIDE (SOL)

U.S. Army Corps of Engineers, South Pacific Division, Los Angeles District, Los Angeles, CA
Contract Opportunities on SAM.gov W912PL24R0014, 2024

This is a full and open competition under NAICS code 562910. The U.S. Army Corps of Engineers requires support for environmental remediation activities at Vandenberg Space Force Base in California. The range of activities includes maintenance of established remedies, optimization at applicable sites, and achievement of site-specific objectives. The Contractor shall undertake Environmental Remediation activities to achieve performance objectives at 33 Installation Restoration Program sites and 28 Military Munitions Response Program sites. A site visit is scheduled for April 16 through April 18, 2024, at Vandenberg Space Base in Lompoc, California. The contract award will be made to the lowest-priced offer based on an evaluation of the proposals against the solicitation's evaluation criteria and will have a 10-year period of performance with a start date of September 24, 2024. Offers are due by 2:00 PM PDT on April 24, 2024. https://sam.gov/opp/85432dfc919d4bad9ba33d935ff908f1/view.

JOINT BASE CAPE COD (JBCC) OPTIMIZED REMEDIATION CONTRACT (ORC) (PRESOL)

U.S. Army Corps of Engineers, North Atlantic Division, Baltimore, MD
Contract Opportunities on SAM.gov W912DR24R0018, 2024

When this solicitation is released on or about April 17, 2024, it will be competed as a total small business set-aside under NAICS code 562910. The U.S. Army Corps of Engineers (USACE) Baltimore District intends to issue a solicitation for a standalone "C" type contract to provide support to the Air Force at Joint Base Cape Cod in executing its Environmental Restoration Program via a performance-based Optimized Remediation Contract. The work will consist of the performance of environmental remediation activities necessary for investigation, design, remedial action, remedial construction, and Long-Term Management to achieve minimum Performance Objectives and stretch goals and support progress to Site Closeout at 16 Installation Restoration Program and one Military Munitions Response Program sites in various phases of remediation. There is no solicitation at this time. https://sam.gov/opp/f7c39c41d00a47fc96ff028a2a1531d4/view.

NTCRA UNDER CERCLA AT VIRGIN ISLANDS NAT'L PARK (SOL)

U.S. Department of Interior National Park Service, PWR OLYM MABO, Port Angeles, WA
Contract Opportunities on SAM.gov 140P2124R0023, 2024

This is a total small business set-aside under NAICS code 562910. The U.S. Department of Interior National Park Service requires a contractor to implement a Non-Time Critical Removal Action work plan at Caneel Bay Resort in Virgin Islands National Park. The work includes removing approximately 13,000 bank cubic yards (BCY) of contaminated soil and landfill refuse and approximately 40 loose CY of contaminated sediment, transporting it to appropriate disposal facilities on the mainland, and performing limited site restoration, such as spreading and compaction of clean fill and/or stockpiled soil, grading, preparation of topsoil, seeding. The estimated removal quantities are based on previous site investigations. The contract will use unit-priced items subject to the variation in quantity clause in conjunction with an established ceiling and notification requirements. A recorded virtual site visit will be posted at https://parkplanning.nps.gov/documentsList.cfm?parkID=412&projectID=100132. No access will be granted to Caneel Bay Resort for informal site visits and requests for individual site visits will not be honored. The Resort is currently operated by a third party who has a guard present at the entry to the resort. Prospective offerors must not contact the Resort Operator for direct access pertaining to this solicitation. The award will be a single firm-fixed-price contract with a 390-day period of performance. Offers are due by 2:00 PM PDT on May 6, 2024.https://sam.gov/opp/dc8201764884d9aeb6a75da7308f2810/view.

Cleanup News

RESTORING BROWNFIELDS WITH ENHANCED PHYTOREMEDIATION: CASE STUDIES OF SUCCESSFUL INSTALLATIONS

Murphy, R. I AEHS Foundation 33rd Annual International Conference on Soil, Water, Energy, and Air, 18-21 March, San Diego, CA, 33 slides, 2024

This presentation focuses on endophytic microbes targeted to specific classes of contaminants and specialized tree cultivars. It includes technical background, applications, and lessons learned from full-scale deployment on Brownfield sites. Plant-microbe symbiotic systems expand the range of sites available for phyto and provide increased degradation for the targeted classes of contaminants. By incorporating contaminant-specific endophytes, phytoremediation methods can address chlorinated solvents, petroleum hydrocarbons, explosives, PCBs, and mixed waste sites at higher contaminant levels—achieving greater tree survival and higher rates of biodegradation than conventional phytoremediation. Phytoremediation provides resilient site treatment, improved land value, large cost savings, carbon sequestration, reduced heat island effect, and green space restoration. https://www.xcdsystem.com/AEHS/abstract/File23293/PDFforhandouttoattendeesppt_225_040101113.pdf

DON'T "SCRAP" YOUR PRB – HOW TO OPTIMIZE TREATMENT AND REDUCE COST FOR CHLORINATED CONTAMINANT DESTRUCTION

Pare, J. I SMART Remediation, 25 January, Toronto, Canada, 18 slides, 2024

Column studies were conducted to investigate the potential benefits of alternative designs and explore the performance of sponge ZVI media when used in a 'typical' PRB design. The lab column test consisted of a novel sponge ZVI media, a conventional non-sponge ZVI media, and a control for benchmarking. A two-month study using c-VOC-contaminated groundwater from a site in the eastern U.S. Aqueous concentrations of cVOC were monitored along the column length to evaluate their degradation kinetics. Results concluded that, compared to the conventional ZVI media, the sponge iron media requires up to 30% less material (by weight) to achieve the same volumetric fill requirements. Results also confirmed that sponge-iron-based ZVI media showed similar or better c-VOC removal with lower mass. This may offer significant cost advantages in real-world applications. The lab and full-scale application of this technology are presented and discussed.
https://smartremediation.com/wp-content/uploads/2024/03/SMART-Toronto_Ottawa-Jean-Pare-%E2%80%93-Jan-25-Feb-8-2024.pdf

PERFORMANCE EVALUATION AND OPTIMIZATION OF THE PUMP AND TREAT SYSTEM FOR A LARGE COMINGLED PLUME IN SOUTHERN CALIFORNIA

Wang, L., T. Zielinski, C. Bucklin, A. Vaidya, T. Dolan, J. Zhang, and M. Wright. I AEHS Foundation 33rd Annual International Conference on Soil, Water, Energy, and Air, 18-21 March, San Diego, CA, 30 slides, 2024

Multiple lines of evidence were used to evaluate the performance of a P&T system at the San Gabriel Valley Superfund site in southern California. Decades of poor chemical handling and disposal practices resulted in a large, comingled VOC plume. Optimization measures were developed to improve the plume capture and efficiency of the P&T system for the South El Monte Operable Unit (SEMOU). The groundwater monitoring and system operational data were reviewed to evaluate the concentration trends and plume containment status. Additional water chemistry and isotope data were collected to study the potential hydraulic connection between surface water recharges and the extracted groundwater. EPA's 3-D groundwater flow and transport model, developed using the finite-element groundwater flow and transport modeling software (FEFLOW), was revised based on an improved understanding of the hydrogeological features in the region and the operational condition of nearby production wells. The revised model was then used to conduct particle tracking for capture zone analysis. Contaminant transport was also simulated to evaluate potential optimization measures for improving the remedy performance. Based on these evaluations, system optimization may include installing one new deeper extraction well at a strategic location to best use the existing infrastructure. Numerical modeling is useful in designing and evaluating P&T systems at large complex groundwater sites, but it must be based on a good understanding of hydrogeology and contaminant transport. Collaboration among multiple stakeholders is also necessary to develop a balanced and sustainable pumping strategy in the region, maximizing the groundwater remedy's efficiency and effectiveness. https://www.xcdsystem.com/AEHS/abstract/File23293/PDFforhandouttoattendeesppt_125_032011225.pdf
Enhanced Remedial Alternatives Study for SEMOU: https://semspub.epa.gov/work/09/100031579.pdf

IMPLEMENTING CLIMATE RESILIENCE IN REMEDY PROTECTIVENESS AT EPA-MANAGED CONTAMINATED SITES IN CALIFORNIA

Irwin, K. I AEHS Foundation 33rd Annual International Conference on Soil, Water, Energy, and Air, 18-21 March, San Diego, CA, 24 slides, 2024

EPA's Pacific Southwest Office is taking actions to address climate vulnerability and resilience at contaminated sites in California managed by EPA, including Superfund, RCRA, and PCB cleanup sites, which are highlighted in this presentation. Examples of site climate vulnerability assessments and resilience measures were featured, with a deeper dive into considerations for PCB cleanup sites. Content addressed potential pathways by which PCBs can enter water bodies, recommended steps for evaluating climate vulnerability and rising groundwater at PCB sites, and resilience provisions that can be included in long-term site maintenance and monitoring plans. https://www.xcdsystem.com/AEHS/abstract/File23293/PDFforhandouttoattendeesppt_227_031508095.pdf

Demonstrations / Feasibility Studies

DEVELOPMENT OF A COST EFFECTIVE 1,4-DIOXANE TREATMENT SYSTEM FOR SMALL COMMUNITY WATER SUPPLIES

EPA Office of Research and Development, EPA 600/R-23/075, 45 pp, 2023

The New York State Department of Environmental Conservation (NYSDEC) is working with EPA Region 2 to sample 1,4-dioxane in groundwater at 725 remedial program sites across New York. The preliminary data indicate that exceedances above the proposed MCL of 1 µg/L occurred at 174, or 24%, of the sites. NYSDEC is evaluating an MCL recommendation of 1 µg/L for 1,4-dioxane from the NY Drinking Water Quality Council, which, if adopted, would be the nation's most stringent drinking water standard for 1,4-dioxane. This research aimed to develop and evaluate a cost-effective, low-maintenance 1,4-dioxane treatment technology for small-scale Point of Entry Treatment (POET) systems. Bench- and pilot-scale tests were conducted at EPA's Test Evaluation Facility in Cincinnati, Ohio, on 1,4-dioxane-spiked tap water. Based on the bench-scale testing, the pilot-scale testing focused on mixing ozone and hydrogen peroxide, effectively destroying 1,4-dioxane in water. Using a combination of ~3.5 mg/L hydrogen peroxide and 5 mg/L ozone, water flow rates up to 10 gallons per minute containing up to 200 µg/L 1,4-dioxane were treated. Influent 1,4-dioxane concentrations of ~10 µg/L, 20 µg/L, 80 µg/L, and 180 µg/L were reduced to effluent 1,4-dioxane concentrations of ~0.4 µg/L, 0.7 µg/L, 5 µg/L, and 10 µg/L, respectively, when treated at flow rates of ~10 gpm.
https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=359469&lab=CESER&keyword=community+resilience&sortby=revisionDate

REMOTE MONITORING OF NATURAL SOURCE ZONE DEPLETION USING TEMPERATURE DATA TO SUPPORT LONG-TERM PASSIVE MANAGEMENT STRATEGIES

McHugh, T., T. Sale, and T. Lewis. ESTCP Project ER19-5091, 213 pp, 2023

The specific objectives of this demonstration program were to: (1) demonstrate the use of innovative, inexpensive 2nd generation temperature monitoring systems to improve data quality and reduce costs; (2) demonstrate improved methods to separate the heat signal associated with biodegradation of petroleum from seasonal and other sources of temperature fluctuations in soils; (3) demonstrate that temperature based approaches to quantifying natural source zone depletion (NSZD) rates are particularly suited for LNAPL source areas located below paved surfaces; and (4) compile results from monitoring of NSZD at many sites and utilize these results to i) document the range of NSZD rates and ii) identify site factors that may be predictive of higher or lower NSZD rates at individual sites. NSZD was documented to occur at all sites across 40 sites where NSZD rates have been measured; rates did not vary by fuel type. NSZD was also documented at two demonstration sites under paved and unpaved locations. Different methods used to quantify rates yielded a range of rates generally within an order of magnitude. While offering some clear advantages, additional work may be required to fully validate 2nd generation monitoring equipment and background correction methods, especially to resolve short-term NSZD rates. The primary cost driver is the cost of the temperature sensor stations. While one-time measurements of NSZD may be cheaper for single measurements, the temperature-based methods offer clear cost advantages at sites where long-term monitoring is required or advantageous. The results of these two demonstration sites, a review of 40 sites in the published literature, and recent guidance documents indicate the presence and magnitude of NSZD processes and provide further guidance for reliable methods to quantify NSZD rates. The 2nd generation monitoring sensors and communication equipment can be procured from S3NSE Technologies as newly commercialized, custom-built equipment.
https://serdp-estcp-storage.s3.us-gov-west-1.amazonaws.com/s3fs-public/2024-01/ER19-5091%20Final%20Report.pdf?VersionId=9lxqVlALQXMhBZxD3X9xZLPiGxHiB5B
Executive Summary: https://serdp-estcp-storage.s3.us-gov-west-1.amazonaws.com/s3fs-public/2024-01/ER19-5091%20Executive%20Summary.pdf?VersionId=t_gvCp8Gxq00vk1CV3UBiLjBxYWM1_4p

AN INNOVATIVE PERMEABLE REACTIVE BIO-BARRIER TO REMEDIATE TRICHLOROETHENE-CONTAMINATED GROUNDWATER: A FIELD STUDY

Lu. C.-W., K.-H. Lo, S.-C. Wang, C.-M. Kao, and S.-C. Chen.
Science of The Total Environment 920:170885(2024)

An innovative permeable reactive bio-barrier (PRBB) system comprising immobilized *Dehalococcoides mccartyi* (Dhc) and *Clostridium butyricum* embedded into the silica gel was developed in a field study to treat TCE-polluted groundwater long-term. Four injection wells and two monitoring wells were installed downstream of the TCE plume. Without PRBB, results showed that the TCE (6.23 ± 0.43 μmole/L) was converted to *cis*-dichloroethene (0.52 ± 0.63 μmole/L), and ethene was not detected. With PRBB treatment, TCE was completely converted to ethene (3.31 μmole/L), indicating that PRBB could promote complete dechlorination of TCE. PRBB showed the long-term capability to maintain high dechlorinating efficiency for TCE removal during the 300-day operational period. With qPCR analysis, the PRBB application could stably maintain the populations of Dhc and functional genes (bvcA, tceA, and vcrA) at >108 copies/L within the remediation course and change the bacterial communities in the contaminated groundwater.

VAPOR INTRUSION THROUGH SEWERS: SAMPLE COLLECTION AND MITIGATION METHODS

Lee, A. I SMART Remediation, 25 January, Toronto, Canada, 23 slides, 2024

This presentation provides a case study for collecting sewer samples using both passive and active sampling methods. The advantages and disadvantages of each method are discussed along with co-located comparison data. The presentation highlights the investigation of a sewer line that contained VOC vapors and residential buildings downgradient of a contaminated site. Based on the preferential pathway assessment findings, mitigation measures, consisting of active sewer venting, were deemed appropriate. An overview of the design, installation, and post-monitoring results are discussed. Lessons learned through investigating and implementing the mitigation measures are also highlighted.
https://smartremediation.com/wp-content/uploads/2024/03/SMART-Toronto-Annie-Lee-%E2%80%93-January-25-2024.pdf

Research

USING GEOSPATIAL DATA AND RANDOM FOREST TO PREDICT PFAS CONTAMINATION IN FISH TISSUE IN THE COLUMBIA RIVER BASIN, UNITED STATES

DeLuca, N.M., A. Mullikin, P. Brumm, A.G. Rappold, and E.C. Hubal.
Environmental Science & Technology 57(37):14024-14035(2023)

Decision makers in the Columbia River Basin (CRB) are currently challenged with identifying and characterizing the extent of PFAS contamination and human exposure. A methodology was developed and piloted to help decision-makers target and prioritize sampling investigations and identify contaminated natural resources. Random forest models were used to predict ΣPFAS in fish tissue; understanding PFAS levels in fish is particularly important in the CRB as fish are a major component of tribal and indigenous people's diets. Geospatial data, including land cover and distances to known or potential PFAS sources and industries, were leveraged as predictors for modeling. Models were developed and evaluated for Washington state and Oregon using limited available empirical data. Mapped predictions show several areas where detectable PFAS concentrations in fish tissue are predicted to occur, but sampling has not yet been confirmed. Variable importance is analyzed to identify potentially important sources of PFAS in fish in this region. The cost-effective methodologies demonstrated here can help address the sparsity of existing PFAS occurrence data in environmental media in other regions while also providing insights into potentially important drivers and sources of PFAS in fish.

NEW MODEL ESTIMATES THE EFFECTS OF DIOXIN ON LIVER CHOLESTEROL

National Institute of Environmental Health Sciences, Superfund Research Program (SRP), February 2024

SRP-funded scientists developed a computer model to determine the health effects of exposure to dioxins. The model combines exposure data and known health outcomes to assess the overall risk chemicals could pose to health. Researchers created a computational model to show how 2,3,7,8- tetrachlorodibenzo-p-dioxin (TCDD) affects biological processes that increase cholesterol levels in the liver. An innovative template-and-anchor model was created that combines two types of computational models. The template represents how TCDD toxicity affects how the body handles cholesterol, while the anchor represents cholesterol-related interactions between blood and the liver and metabolic processes essential to cholesterol synthesis. The team used data from the Comparative Toxicogenomic Database and the Toxin and Toxin Target Database to build their model. The team calibrated the parameters in the model's mathematical equations to ensure accuracy using data from published cell-based and animal studies. Next, they tested the model using data from human studies and found that its output agreed with the published results. The team ran two variations of the model to analyze the effects of TCDD on cholesterol: a partial model that included only the effects of TCDD on the mevalonate pathway and a full model that added cholesterol exchange between the liver and blood. Findings indicate that genes associated with cholesterol transport from blood to the liver play a key role in cholesterol deposition in the organ. Another simulation was run to study how dietary cholesterol intake might act with TCDD to affect cholesterol levels in the liver and blood. The model was run with different levels of dietary cholesterol and with and without TCDD exposure. Higher dietary intake of cholesterol increased those levels in the liver and, to a lesser degree, in the blood. Adding TCDD greatly increased cholesterol levels in the liver. Moreover, as dietary intake increased, the effects of TCDD on liver cholesterol increased. https://tools.niehs.nih.gov/srp/researchbriefs/view.cfm?Brief_ID=350.

ALUNITE SUPERGROUP MINERAL FORMATION IN SOIL DECREASES LEAD AND ARSENIC BIOAVAILABILITY: A PATH TOWARDS CONCOMITANT REMEDIATION
Sowers, T., M. Blackmon, R. Karna, Matthew Noerpel, A. Betts, G. Diamond, D. Thomas, K. Bradham, and K. Scheckel. American Chemical Society Meeting, New Orleans, LA, 17-21 March, 22 slides, 2024.

An alternative approach to reduce exposure through ingestion of contaminated soil involves the conversion of soil Pb/As species into forms that are less likely to cross the gastrointestinal tract (GIT) barrier when ingested. A team of researchers developed a novel co-contaminant soil treatment technique stemming from unique observations at a Superfund site, that promotes the formation of plumbojarosite (PLJ). Conversion of soil PB to PLJ reduces Pb relative bioavailability by >90% and decreases the amount of ingested soil Pb that crosses the GIT barrier. Options are still being fine-tuned to promote mineral transformation, and questions remain about how Pb and/or PLJ interact with elements as soil moves through the GIT. Properties of pre- and post-treatment soils were examined using heat-dependent PLJ precipitation methods, and a newly developed K-jarosite seeding treatment was conducted at ambient temperature while also assessing treatment impacts on both Pb and As sequestration. Bulk and spatially-resolved X-ray absorption spectroscopy revealed that both treatments effectively converted Pb and As contaminated soil to low bioaccessibility/bioavailability PLJ. Results suggest that jarosite-conversion techniques are a promising option for soil Pb and As remediation; however, further investigation applying these chemical techniques in field conditions is needed to assess long-term efficacy and suitability.
https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=360991&Lab=CESER&simplesearch=0&showcriteria=2&sortby=pubDate&timstype=&datebeginpublishedpresented=06/15/2019&searchall=remediation

COMPARING PFAS REMOVAL ACROSS MULTIPLE GROUNDWATERS FOR EIGHT GACS AND ALTERNATIVE ADSORBENT
Pannu, M.W., J. Chang, R. Medina, S.A. Grieco, M. Hwang, and M.H. Plumlee.
AWWA Water Science 5(3):e1345(2023)

Eight granular activated carbons (GACs) and one alternative adsorbent (AA) were evaluated using rapid small-scale column tests (RSSCTs) to remove low-level PFAS from groundwater. Results suggested variability among waters for adsorbents to reach breakthrough. The time to reach breakthrough appeared to be inversely proportional to the background dissolved organic carbon (DOC). Bituminous GACs (particularly F400 and UC1240LD) were more effective than non-bituminous. The elution order for PFAS was PFHxA (C6) > PFBS (C4) > PFOA (C8) > PFHxS (C6) > PFOS (C8). Multivariate regression predicted bed volumes at which F400 reached significant exhaustion (defined here as 60%) for PFOA using humic acid and DOC. This merits further study as these parameters could potentially be incorporated into models for predicting PFAS breakthrough. The presence of VOCs negatively impacted PFAS adsorption on GAC. Relative to GACs, the AA were less impacted by DOC and showed superior performance. https://awwa.onlinelibrary.wiley.com/doi/epdf/10.1002/aws2.1345

MODELING DISSOLUTION OF SOLUBLE COMPOUNDS FROM MULTICOMPONENT NAPL USING A DESORPTION APPROXIMATION
Gefell, M.J. and D. Gurung. I Groundwater 61(6):879-886(2023)

An equilibrium partitioning approximation was introduced in a study to simulate the dissolution of the most soluble chemical components from multicomponent NAPL containing a significant fraction of relatively insoluble mass. The properties of the NAPL and the porous medium were used to estimate the effective distribution coefficient that describes depletion of a specific compound from NAPL. Numerical modeling results that support the method's utility, with verification using published empirical data collected during residual coal tar dissolution in a controlled lab sand tank experiment, are presented. The numerical modeling method uses equilibrium partitioning as an approximation and matched the concentrations of the two most soluble NAPL components in and downgradient of the NAPL zone with reasonable accuracy. Results suggest that the method may be useful for screening-level assessments and can be adapted to compare relative groundwater restoration timeframes of select NAPL components for various remedial alternatives.

NEW INSIGHTS INTO LONG-LASTING CR(VI) REMOVAL FROM GROUNDWATER USING IN SITU BIOSULFIDATED ZERO-VALENT IRON WITH SULFATE-REDUCING BACTERIA
Xu, h., C. Qin, H. Zhang, and Y. Zhao.
Journal of Environmental Management 355:120488(2024)

A study evaluated the ability of the sulfate-reducing bacteria (SRB)-biosulfidated ZVI (SRB-ZVI) system and compared it to a Na_2S-sulfidated ZVI system. Biosulfidated-ZVI granules and FeSx suspension are the major components of the SRB-ZVI system. The SRB-ZVI system forms a thicker and more porous FeSx layer than the Na2S-sulfidated ZVI system, resulting in more sufficient ZVI sulfidation and a 2.5 times higher Cr(VI) removal rate. The SRB-ZVI system exhibits a long-lasting (11 cycles) Cr(VI) removal performance due to FeSx regeneration; however, the Na2S-sulfidated ZVI system can perform only two Cr(VI) removal cycles. SRB attached to biosulfidated-ZVI can survive in the presence of Cr(VI) because of the protection of the biogenic porous structure, whereas SRB in the suspension is inhibited. After Cr(VI) removal, SRB repopulates in the suspension from biosulfidated-ZVI and produces FeSx, thus providing conditions for subsequent Cr(VI) removal cycles. Overall, the synergistic effect of SRB and ZVI provides a more powerful and environmentally friendly sulfidation method, which has more advantages for Cr(VI) removal than those of chemical sulfidation.

General News

SUPERFUND ACCOMPLISHMENTS QUARTERLY REPORT - FISCAL YEAR 2023
EPA Website, Updated March 5, 2024

EPA's Superfund Accomplishments Report highlights the important work of EPA staff and partners to clean up the nation's most contaminated land and respond to environmental emergencies and natural disasters. Superfund cleanups protect human health and the environment while supporting community revitalization efforts and economic opportunities through redevelopment. https://www.epa.gov/superfund/superfund-accomplishments-quarterly-report-fiscal-year-2023

SRP SEMINAR SERIES ON THE COMPLEXITY AND PERSISTENCE OF PFAS COMPOUNDS
National Institute of Environmental Health Sciences, Superfund Research Program (SRP), January 2024

The SRP brought together several grant recipients and experts from other federal agencies to discuss new strategies and continuing challenges for PFAS site characterization. Hosted in partnership with EPA, the three-session event, Tools for PFAS Site Characterization, included presentations on research efforts and tool development for sampling, monitoring, detecting, and characterizing PFAS:

- **Session I — Novel Analytical Chemistry Approaches for PFAS** featured SRP-funded investigators working on innovative methods to classify and/or quantify PFAS compounds. https://www.clu-in.org/conf/tio/PFAS-Characterization-1_100623/
- **Session II — PFAS Sources and Mapping>** highlighted case studies featuring SRP-funded research to understand PFAS sources and to predict fate and transport. https://www.clu-in.org/conf/tio/PFAS-Characterization-2_102023/
- **Session III — Standards, Passive Sampling, and Modeling of PFAS** included federal and SRP-funded researchers featuring useful resources that can aid in site characterization, such as PFAS reference materials, libraries, and passive samplers. https://www.clu-in.org/conf/tio/PFAS-Characterization-3_110823/

https://tools.niehs.nih.gov/srp/news/view.cfm?newsitem_ID=3150

SOIL MANAGEMENT TECHNOLOGY AT THE TORONTO PORTLANDS
Alimohamed, S. I SMART Remediation, 8 February, Ottawa, Canada, 35 slides, 2024

This presentation describes the new-age soil management technologies implemented at sites across Canada, initiated by work at the Toronto Port Lands project. Construction of the Toronto Port Lands Flood Protection and Enabling Infrastructure Project is occurring in parallel with the introduction of environmental regulations that enforce tracking of soil leaving the site. Due to several reuse applications, all soil being reused also requires tracking. This has led to the creation of new technologies to reuse the majority of the 1 million m^3 of soil being managed. New technologies like 3-D digital models, GPS-driven machine control and remote sensing, cloud-based truck tracking, environmental and geotechnical analytical data management, and a QP approvals platform work together to form a sophisticated, integrated tracking system. https://smartremediation.com/wp-content/uploads/2024/03/SMART-Toronto_Ottawa-Sajid-Alimohamed-%E2%80%93-Jan-25-Feb-8-2024.pdf

PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS): FROM REGULATIONS TO REMEDIATION
Phillips, J., A. Wilson, L. Wang, L. Trozzolo, and T. McKnight. I AEHS Foundation 33rd Annual International Conference on Soil, Water, Energy, and Air, Workshop 1, 18-21 March, San Diego, CA, 172 slides, 2024

This workshop provides owners, site managers, attorneys, regulators, and environmental scientists and engineers with a practical, in-depth understanding of the complexities that PFAS introduces to environmental sites and strategies to manage them in an uncertain regulatory environment. The workshop reviews current federal and state PFAS regulations, including the current information on the CERCLA listing and pending MCL determination. Lab method development efforts, both from EPA and within the industry, are presented, and their application to wastewater and biosolids, drinking water, consumer products, human and animal blood, and the demonstration of complete PFAS destruction are addressed. A summary of recent toxicity information, both human and ecological, is provided for all PFAS analytes that have been released. The workshop also evaluates PFAS disposal and treatment options, including incineration, landfilling, and emerging wastewater treatment approaches, and the knowledge gaps, uncertainties, and lifecycle risks associated with each. It concludes with a regulatory perspective from the State of California Department of Toxic Substances Control, discussing issues and lessons learned from PFAS investigations and treatment pilot studies at various DOD sites in California.
https://www.xcdsystem.com/AEHS/abstract/File23293/PDFforhandouttoattendeesopt_158_031804523B.pdf

DEVELOPMENT AND APPLICATION OF AN INTEGRATED SITE REMEDIATION TECHNOLOGY MIX METHOD BASED ON SITE CONTAMINANT DISTRIBUTION CHARACTERISTICS
Zhang, M., S. Yang, Z. Zhang, C. Guo, Y. Xie, X. Wang, L. Sun, and Z. Ning.
Applied Sciences 13:11076(2023)

The "contamination source control-process blocking-in situ remediation" technology mix model has gradually gained appreciation in recent years, but screening technologies within each chain of this model rely heavily on arbitrary personal experience. This study proposed a method to screen the optimal technologies for site remediation. The method is rooted in the "contamination source control-process blocking-in situ remediation" site remediation principles, the distribution characteristics of contaminants, and relationships among different areas including the source zone, plume area, and potentially contaminated area. A scientific screening and combination procedure was developed that considers the distribution characteristics of contaminants and was applied to a petroleum- and LNAPL-contaminated site. By using the procedure, a technology mix was identified that includes institutional controls, risk monitoring, emergency response, multiphase extraction, an interception ditch, monitoring of natural attenuation, hydrodynamic control, and some alternative technologies aimed at different locations and strata. The clear spatial relationship concept promises to enhance the effectiveness of contaminated site remediation. The proposed method provides a technical framework and should be tested and enriched in future studies. https://www.mdpi.com/2076-3417/13/19/11076/pdf?version=1696901801

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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