Technology Innovation News Survey

Entries for July 16-31, 2021

Market/Commercialization Information

CONSTRUCTION: MANSFIELD MINE RECLAMATION
USDA Forest Service, Southwestern Regional Office, Region 3, Albuquerque, NM.
Contract Opportunities at SAM.gov, Solicitation 127EAX21R0040, 2021

This RFP is 100% small business (750 employees) set aside under NAICS code 562910. The USDA Forest Service, Coronado National Forest, Nogales Ranger District has a requirement for mine reclamation work. The scope of work consists of construction activities associated with reclamation of designated areas within Mansfield Canyon, which is located near Patagonia, Santa Cruz County, AZ 85624. Project magnitude falls between $250,000 - $500,000. The Government anticipates awarding a firm-fixed-price contract based on Best Value - Tradeoffs. Offers are due by 4:00 PM PT on September 7, 2021. https://sam.gov/opp/1424c50982cd42cd92ce378d7ae3b226/view

WATERSHED COOPERATIVE AGREEMENT PROGRAM (WCAP) NOT-FOR-PROFIT ACID MINE DRAINAGE (AMD) RECLAMATION PROJECTS
Department of the Interior, Office of Surface Mining, Funding Opportunity S21AS00571, 2021

The funding priorities and technical focus for this announcement are to restore streams affected by acid mine drainage from coal mines to a level that will support a diverse biological community and provide recreational opportunities for the public. Applications are due by 5:00 PM ET on September 7, 2021. Funding of up to $100,000 will be provided via a cooperative agreement out of total estimated program funding of $2M. Eligible applicants are limited to not-for-profit IRS 501(c)(3) status organizations. https://www.grants.gov/web/grants/view-opportunity.html?oppId=334501

DLA INSTALLATION MANAGEMENT, ENVIRONMENTAL MANAGEMENT, ENVIRONMENTAL LIABILITIES MANAGEMENT PROGRAM SUPPORT
U.S. Army Corps of Engineers, Baltimore District, Funding Opportunity W912DR21R0067, 2021

The U.S. Army Corps of Engineers, Baltimore District, has issued this Sources Sought notice under NAICS code 561990 solely for information/market research purposes to determine the interest, availability, and the capability of potential sources to satisfy an upcoming requirement for Contractor support to assist in program management-related functions and to provide financial expertise to the Restoration Division of the Defense Logistics Agency, Installation Management, Environmental Management. Small businesses, certified 8(a), certified HUBZone, economically disadvantaged woman-owned, and service-disabled veteran-owned small businesses are encouraged to respond to this notice by submitting brief (7 pages max) capability statements. Responses are due by 11:00 AM ET on September 10, 2021. https://sam.gov/opp/0fe417ac1fd14b5ca7c0433d29d02e03/view

SUSTAINABLE MATERIALS MANAGEMENT GRANTS
Environmental Protection Agency, Funding Opportunity EPA-LCRD-SMMS-2021-2, 2021

This notice announces the availability of funds and solicits applications that support the EPA Sustainable Materials Management Program for the benefit of States or communities within EPA Region 2 (New York, New Jersey, Puerto Rico, U.S. Virgin Islands, and eight Indian Nations). Sustainable Materials Management (SMM) is a systemic approach to using and reusing materials more productively over their entire life cycles. It represents a change in how our society thinks about the use of natural resources and environmental protection. By looking at a product's entire life cycle, we can find new opportunities to reduce environmental impacts, conserve resources and reduce costs. Specifically, this RFA addresses the following programmatic priorities: Sustainable Management of Food and Sustainable Packaging. The closing date and time for the receipt of applications is October 1, 2021, by 11:59 PM ET to be considered for funding. https://www.grants.gov/web/grants/view-opportunity.html?oppId=335367

US EPA REGION 4 ERTEM
Environmental Protection Agency, Region 4, Atlanta, GA.
Contract Opportunities at SAM.gov, Solicitation 68HE0421R0007, 2021

This procurement is an 8(a) set-aside. U.S. EPA Region 4 requires a full-service equipment maintenance, training, and logistics contractor for its hazardous materials response equipment. Services are to be performed at the EPA Regional Readiness Center (RRC) located at 2999 Pacific Drive Suite F, Norcross, Georgia; the EPA Regional Office located at 61 Forsyth Street SW, Atlanta; the out-posted OSC offices; and response sites. Region 4 includes the states of Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee. The contractor will be required to manage an inventory of equipment and supplies and maintain and calibrate government-owned equipment used by the Emergency Response Removal and Prevention Branch. The equipment must be kept in a continuous state of response readiness 24 hours a day, 365 days a year for routine and emergency use on-site, demonstration of the use of the equipment during drills and exercises, and transportation or shipment of the equipment and necessary supplies. The contractor will be required to assist the ERRPB in developing and delivering preparedness drills and exercises utilizing the response equipment and may be tasked to procure specialized training. See details on FedConnect at https://www.fedconnect.net/FedConnect/?doc=68HE0421R0007&agency=EPA. Offers are due via FedConnect by noon ET on September 13, 2021. https://sam.gov/opp/3996125822ab4d0980c02ff517500fdf/view

Cleanup News

1-2 PUNCH TAKES OUT 1,4-DIOXANE ON LONG ISLAND
Bindner, S. WaterWorld, 16 August, 2021

Long Island's Suffolk County Water Authority (SCWA) investigated an advanced oxidation process (AOP) using hydrogen peroxide in combination with ultraviolet (UV) light to reduce 1,4-dioxane concentrations in groundwater used as the drinking water source. Full-scale UV AOP was implemented following an effective pilot program that removed greater than 1-log (90%) 1,4-dioxane H2O2 concentrations of 2 ppm and above and effectively removed other VOCs. The TrojanUVPhox®72AL75 system treating a maximum flow of 1,100 gpm was installed in 2016, with follow-up performance verification. The results exceeded 1.7-log dioxane removal, and the New York State Department of Health subsequently approved UV AOP technology as the site's 1,4-dioxane treatment process at the start of 2018. UV AOP technology continues to be among the best available groundwater remediation technology for 1,4-dioxane and other groundwater contaminants such as TCE and TCA. https://www.waterworld.com/drinking-water/potable-water-quality/article/14202463/12-punch-takes-out-14dioxane-on-long-island
Also see pamphlet for more information on pilot study: https://vertassets.blob.core.windows.net/download/970b296d/970b296d-7504-4d04-b95a-c31500b79a18/nassau_county_case_study_-_advanced_oxidation.pdf

FORMER BRENEMAN SITE OSWEGO COUNTY OSWEGO, NEW YORK FINAL ENGINEERING REPORT
LaBella Associates, DPC on behalf of Canalview Development, LLC, 300 pp, 2020

Remedy includes ISCO using PeroxyChem Klozur® CR This report describes implementation of a remedy that included ISCO to treat contaminated soil and groundwater. The selected oxidant was PeroxyChem Klozur® CR, a high-pH activated persulfate product that includes a calcium peroxide compound to release oxygen over time to facilitate microbial degradation of residual petroleum compounds. A total of 6,500 lbs of Klozur® CR was mixed into a slurry (~20% by volume) and injected via 16 injection points spaced ~10 ft apart. The report summarizes the remedial performance monitoring program and sampling results for soil and groundwater. Since contaminated soil and groundwater remain beneath the site following the remedial action, institutional and engineering controls are required to protect human health and the environment.
https://www.dec.ny.gov/data/DecDocs/C738046/Report_RCP_C738046_2020-07-30_FER%20-%20Part%201%20of%203%20-%20Text_%20Figures_%20Append%20A-J.pdf
Appendices K-L: https://www.dec.ny.gov/data/DecDocs/C738046/Report_RCP_C738046_2020-07-30_FER%20-%20Part%202%20of%203%20-%20Append%20K-L.pdf
Appendices M-N: https://www.dec.ny.gov/data/DecDocs/C738046/Report_RCP_C738046_2020-07-30_FER%20-%20Part%203%20of%203%20-%20Append%20M-N.pdf
Certificate of Completion: https://www.dec.ny.gov/data/DecDocs/C738046/Certificate%20of%20Completion_RCP_C738046_2020-08-19_Executed%20COC.pdf
More site documents: https://www.dec.ny.gov/data/DecDocs/C738046/

SITE CHARACTERIZATION AND ERH REMEDIATION OF VOCS IN SOIL, GROUNDWATER, LNAPL AND DNAPL (PART 1)
Kinney, T. I American Institute of Professional Geologists Michigan Section Workshop, 15-17 June, virtual, 46 minutes, 2021

This video describes an ERH system designed to simultaneously treat 5 separate source areas (totaling ~156,000 ft^2 and extending to a depth of ~25 feet bgs) at a former manufacturing facility. Investigation tools ranged from traditional soil and groundwater sampling to membrane interface probe (MIP), and laser induced fluorescence (LIF). Data visualization helped define areas for further characterization as well as the areas and volumes for remediation. The objectives of the remedy (shallow soil excavation and ERH) were to remove NAPL, reduce source area concentrations, prevent human exposure, and prevent offsite contaminant migration. After 241 days of operation, remediation goals were met by reducing cVOCs by a minimum of 99% or by reducing TCE and TCA to below 1 ppm. ERH removed ~6,721 pounds of VOCs based on a vapor phase treatment monitoring and an additional 7,665 gallons, or ~56,600 pounds, of LNAPL. The usage of digital data compilation and analysis helped streamline both the characterization and remediation activities for this complex project.
https://www.youtube.com/watch?v=Kv1D2K6gVYI

FINAL REMEDIAL DESIGN REPORT SOIL VAPOR EXTRACTION AND TREATMENT SYSTEM AND IN SITU BIOREMEDIATION BANDERA ROAD GROUND WATER PLUME SUPERFUND SITE BEXAR COUNTY, TEXAS
EPA Region 6, 586 pp, 2020

This remedy design report describes the design criteria, design approach, components, and implementation approach for the remedy at two areas of investigation (AOI). At both locations, a combination of in situ biodegradation (via enhanced reductive dichlorination) and SVE were the selected remedies presented in the Record of Decision. To account for groundwater flow direction variability at one AOC, a food-grade emulsified vegetable oil equivalent will be injected in wells configured to form a U-shaped permeable reactive barrier around a building. Deep horizontal wells and Vertebra™ wells are planned for SVE.
http://www.legacyvalleytexas.gov/government/public_works/docs/Bandera%20Road%20Final%20Remedial%20Design%20Report_Revision%2000.pdf

DIRECT AEROBIC NSZD OF A BASALT VADOSE ZONE LNAPL SOURCE IN HAWAII
McHugh, T., C. Newell, B. Strasert, C. Stanley, J. Johnson, T. Henderson, D. Roff, and J. Narusawad. I Journal of Contaminant Hydrology 235:103729(2020)

The carbon dioxide flux (measured using carbon traps) and heat flux based on subsurface temperature gradients were used to measure natural source zone depletion (NSZD) rates at a petroleum release site with basalt geology and deep groundwater >100 m bgs. Both methods documented the occurrence of NSZD and yielded estimates of the NSZD rate that agreed within a factor of two. Soil gas samples collected directly above the water table and at shallower depths within the vadose zone indicated aerobic conditions throughout the vadose zone and no detectable methane, which indicate that NSZD occurs at this site through the direct aerobic biodegradation of LNAPL rather than the two-step process of anaerobic methanogenesis followed by methane oxidation at a shallow depth interval documented at other sites.

Demonstrations / Feasibility Studies

PILOT STUDY TO EVALUATE SOLAR-POWERED AUTOMATED DNAPL COLLECTION SYSTEM, CLIFTON WORKS FORMER MANUFACTURED GAS PLANT (MGP) SITE, STATEN ISLAND, NY
Aldridge, S., P. Cox, S. Pandya, R. Forstner, and J. Hovis.
Manufactured Gas Plant Conference, Philadelphia, PA, October 7-9, 2019. Poster, 2019

The remedy for a former MGP includes the operation of a system to recover DNAPL from 20 collection wells. Manual removal of DNAPL is conducted weekly via pumping to prevent recovered DNAPL from overflowing the well sump. A pilot test is underway to test the efficiency and effectiveness of a solar-powered, weather-controlled automated system currently installed over a single collection well to study potential automation of the DNAPL recovery efforts without creating extensive trenches, drum storage areas, or power requirements. This poster covers components of the standalone self-sufficient system, efficiency of the system in removing collected DNAPL to meet the remediation goal, automated features and maintenance, solar cell performance, effects of winter and summer conditions, and relative costs compared to manual removal.
https://aecom.com/content/wp-content/uploads/2019/10/3_COX_PETE_MGP2019_40x40_POSTER_OCT2019_CROPS.pdf

TEMPORAL VARIABILITY OF CHLORINATED VOLATILE ORGANIC COMPOUND VAPOR CONCENTRATIONS IN A RESIDENTIAL SEWER AND LAND DRAIN SYSTEM OVERLYING A DILUTE GROUNDWATER PLUME
Guo, Y., P. Dahlen, and P. Johnson. I Science of The Total Environment 702:134756(2020)

A three-year investigation of chlorinated volatile organic compound (CVOC) concentrations of vapor samples from land drains, storm drains, and sanitary sewers was undertaken in a neighborhood overlying a large-scale dissolved CVOC groundwater plume. Vapor sampling included collecting grab (time-discrete) samples from up to 277 manholes, hourly grab sampling from three manhole locations, and 24-h duration collection during week-long sampling from 13 land drain and sewer manholes. The spatial distribution of vapor and water concentrations and the temporal variations in the observed vapor values suggest that week-long vapor sampling conducted at different times of the year from manhole locations overlying and outside a dissolved plume may be needed to ensure a robust VI pathway assessment at other sites. Findings may be relevant to regulatory agencies involved in developing current or future VI pathway assessment guidance.

SUMMARY OF ENVIRONMENTAL INVESTIGATION AND REMEDIATION, A-STREET DITCH SEGMENT 1 PILOT STUDY
BrightFields, Inc. on behalf of the Delaware Department of Natural Resources and Environmental Control (DDNREC), 31 pp, 2020

This report summarizes data collected one year after SediMite™ application to clean up PCB-impacted sediments in the A-Street Ditch. Results of sampling conducted in July 2020 showed reduced concentrations of dissolved PCBs in the sediment porewater across the entire project area. Two of the nine samples (one surface water sample and one sediment sample) showed localized increases in PCB concentrations. Potential reasons for these increases are being evaluated. DNREC is planning to assess PCB concentrations in sediment, surface water, and sediment porewater in July 2021. https://documents.dnrec.delaware.gov/dwhs/SIRB/Documents/A-St-Ditch-Pilot-Study-1-Year-Report.pdf
More information on the project: https://dnrec.alpha.delaware.gov/waste-hazardous/remediation/watar/
See YouTube video on the project: https://www.youtube.com/watch?v=3trVfxymJI8Y

CASE STUDY: ELECTROCHEMICAL GEO-OXIDATION (ECGO) TREATMENT OF MASSACHUSETTS NEW BEDFORD HARBOR SEDIMENT PCBS
Zanko, L.M., K. Wittle, and Sibel Pamukcu. | Electrochimica Acta 354:136690(2020)

The electrochemical Geo-Oxidation (ECGO) electrochemical remediation technology was field-tested to reduce PCB-contaminated sediments from New Bedford Harbor under anaerobic conditions typical of saturated and submerged sediments. Full PCB congener analyses and partial PCB scans were performed on samples collected from the ECGO test and control cells. Sample analyses after a 30-month period indicated ~30% total PCB reduction in un-aerated ECGO test cells compared to the control. Final sampling showed reduced total PCB concentration in unaerated test cell, from ~40,000 µg/kg to 200 µg/kg. Conversely, PCB levels in sediments in the aerated ECGO test cell remained relatively unchanged compared to the pre-test level and control. This represented a >90% reduction in total PCBs relative to starting levels and the control sample average.

A FIELD-SCALE REMEDIATION OF RESIDUAL LIGHT NON-AQUEOUS PHASE LIQUID (LNAPL): CHEMICAL ENHANCERS FOR PUMP AND TREAT
Ciampi, P., C. Esposito, G. Cassiani, G.P. Deidda, P. Rizzetto, and M.P. Papini.
Environmental Science and Pollution Research [Published online 3 June 2021 prior to print]

A pilot-scale field experiment was conducted by injecting reagents into the subsoil to stimulate residual hydrocarbon desorption and oxidation to remediate LNAPL and monitored using non-invasive techniques. Geophysical and groundwater monitoring during pilot testing controlled the effectiveness of the intervention, both in terms of product diffusion capacity and in terms of effective reduction of pollutant concentrations. Non-invasive monitoring of reagent migration and its capability to reach the target areas is a major benefit of the remediation technique. The majority of organic contaminants were decomposed, mobilized, and subsequently removed using physical recovery techniques. A considerable mass of contaminant was recovered, resulting in reduced concentrations in the intervention areas. https://link.springer.com/content/pdf/10.1007/s11356-021-14558-2.pdf

Research

ELECTROCHEMICAL DEGRADATION OF PER- AND POLY-FLUOROALKYL SUBSTANCES USING BORON-DOPED DIAMOND ELECTRODES
Uwayezu, J.N., I. Carabante, T. Lejon, P. van Hees, P. Karlsson, P. Hollman, and J. Kumpiene.
Journal of Environmental Management 290:112573(2021)

A 24-factoral design was used to evaluate the effect of several factors, including current density, initial PFAS concentration, electrolyte concentration, treatment time, and their interactions during electrochemical degradation of PFAS using boron-doped diamond (BDD). The study also determined the generation of fluoride in spiked water. The best-performing conditions were applied to degrade PFAS in wastewater samples. The study indicated that the tested method can effectively degrade PFAS in both water and wastewater and suggests that increased treatment time is needed to account for the presence of other oxidizable matrices.

BIODEGRADATION OF WEATHERED PETROLEUM HYDROCARBONS USING ORGANIC WASTE AMENDMENTS
Yousefi, K., A. Mohebbi, and J. Pichtel.
Applied and Environmental Soil Science 2021:6620294(2021)

This study investigated aged crude petroleum-contaminated soil remediation from well fields via simulated landfarming using selected soil amendments over 15 weeks. Soil was treated in combination with plant compost, papermill sludge, activated carbon, and molasses. The greatest percentage removal (40%) of total petroleum hydrocarbons (TPH) occurred in the molasses treatment, followed by a 29% reduction in the plant compost treatment. Findings indicate that it is possible to conduct landfarming of aged petroleum deposits successfully. Common and inexpensive amendments, such as molasses and plant compost, are recommended when feasible.
https://downloads.hindawi.com/journals/aess/2021/6620294.pdf

EXPERIMENTAL AND NUMERICAL ASSESSMENT OF LIGHT NON-AQUEOUS PHASE LIQUID (LNAPL) SUBSURFACE MIGRATION BEHAVIOR IN THE VICINITY OF GROUNDWATER TABLE
Onaa C., E.A. Olaobaju, and M.M. Amro.
Environmental Technology & Innovation 23:101573(2021)

A numerical approach is presented to describe and predict the fate of LNAPL contaminant transport in the subsurface. A multiphase flow concept was adopted that considered oil and gas LNAPL phases using diesel and crude oil as the hydrocarbon contaminants and unconsolidated sand as the porous matrix. The study experimentally simulated surface and subsurface imbibition contaminant flow scenarios. Mass balance equations and constitutive functions from important phenomena that influence subsurface LNAPL contaminant flow are discussed. Extended Darcy's law combined with van Genuchten model was applied in the 2D numerical model description for mass balance equation and constitutive relationship, respectively. The numerical simulation was executed using COMSOL Multiphysics® v. 5.5. The numerical simulation results correlated with the experimental results and suggest that exposure time, fluid viscosity, density, contaminant supply, the amount released, and the hydraulic properties of the porous matrix are the most important parameters in LNAPL contaminant subsurface migration. This study concludes that if the fluid thermodynamic properties and hydraulic properties of the porous matrix are known, the numerical model can accurately predict the migration behavior of hydrocarbon contaminants.

CHARACTERIZATION AND PERFORMANCE OF LACTATE-FEEDING CONSORTIA FOR REDUCTIVE DECHLORINATION OF TRICHLOROETHENE
Li, J., A. Hu, S. Bai, Y. Yang, Q. Sun, X. Liao, and C.-P. Yu.
Microorganisms 9:751(2021)

This study investigated the performance of stable TCE-dechlorinating consortia by monitoring TCE-related metabolite variations and explored their underlying assembly mechanisms using 16S rDNA amplicon sequencing and bioinformatics analyses. Results indicate that lactate can be an effective substrate for stimulated bioremediation of TCE-contaminated sites. The reduction of the stochastic forces or enhancement of the deterministic interventions may promote more effective biostimulation. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8065584/pdf/microorganisms-09-00751.pdf

A NEW RANDOMIZED BINARY PRIOR MODEL FOR HYDRAULIC TOMOGRAPHY IN FRACTURED AQUIFERS
Poduri, S., B.V.N.P. Kambhammettu, and S. Gorugantula.
Groundwater 59(4):537-548(2021)

A novel pilot-point-based hydraulic tomography (HT) inversion procedure is presented that considers a binary prior model developed using a randomized algorithm to delineate preferential flow paths and estimate hydraulic properties in a fractured aquifer. The algorithm discretizes the domain into grid cells, assigning a binary label to each cell, traversing the grid randomly, and choosing the optimal grid configuration. The binary prior model guides the placement of pilot points and constrains aquifer parameters during pilot-point-based HT inversion. Multiple pumping tests were conducted at selected ports using a 2D fractured granite roadblock, and the pressure responses were monitored under controlled lab conditions. The binary prior algorithm was implemented in C++ by supplying the forward groundwater model, HydroGeoSphere. The resulting parameter distributions were assessed by: (1) visual comparing the K- and Ss-tomograms with the known topology of the fractures; and (2) comparing model predictions with measurements made at two validation ports that were not used in calibration. A performance assessment revealed that HT with the randomized binary prior model could recover fracture-connectivity and predict drawdowns in fractured aquifers with reasonable accuracy.

CONTAMINANT DIFFUSION THROUGH A NOVEL COEXTRUDED VAPOR BARRIER
DiBattista, V. and R.K. Rowe.
Journal of Geotechnical and Geoenvironmental Engineering 146(12)(2020)

Organic contaminant diffusion through a novel multilayer coextruded vapor barrier was examined for BTEX, TCE, and PCE. The vapor barrier was composed of linear low-density polyethylene (LLDPE), high-density polyethylene (HDPE), ethylene vinyl alcohol (EVOH), a tie layer (TL), and a degradation layer (DL). Parameters for the LLDPE, HDPE, TL, and DL were developed using material-specific diffusion tests. Contaminant-specific permeation coefficients (Pg) for these materials ranged from 1.4 to 9.2×10^{11} m²/s. The diffusion parameters of the EVOH were inferred from testing of a thin (0.0889-mm) LLDPE/TL/EVOH/TL/EVOH membrane (contaminant-specific Pg values ranged from 1.9 to 7.0×10^{-14} m²/s). The individual layer parameters were used to develop a single set of parameters for each contaminant for the entire vapor barrier. Modeling various vapor intrusion scenarios showed that the multilayer vapor barrier resulted in significantly predicted decreases in airspace concentrations compared to HDPE or no barrier.

UNSATURATED PFOS AND OTHER PFASS IN HUMAN SERUM AND DRINKING WATER FROM AN AFFF-IMPACTED COMMUNITY
McDonough, C.A., S. Choyke, K.E. Barton, S. Mass, A.P. Starling, J.L. Adgate, and C.P. Higgins. I Environmental Science & Technology 55(12):8139-8148 (2021)

Raw water samples from several wells and blood serum samples were collected in 2018 from 220 adult residents of El Paso County, Colorado, to investigate the spatial variability of PFAS exposure in communities near an AFFF source zone. C6 and C8 PFSAs were predominant in serum and water. PFASs were highest in the water district nearest the source zone. A novel PFAS, unsaturated perfluorooctane sulfonate, was detected in >80% of water and serum samples at low concentrations (≤1.9 ng/mL in serum). Drinking water wells nearest the source zone displayed increased prevalence of perfluoroalkyl sulfonamide precursors not detected in serum. Serum-to-water ratios were the greatest for long-chain PFASs and were elevated in the least impacted water district. Additional serum samples collected from a subset of study participants in June 2019 showed that PFAS concentrations in serum declined after exposure ceased. Findings demonstrate that AFFF-impacted communities are exposed to complex, spatially variable mixtures of PFASs.

USE OF A NOVEL BIOMARKER, BOTRYOCOCCANE, TO MONITOR BIODEGRADATION OF TWO LACUSTRINE-SOURCED CRUDE OILS
Douglas, G.S., J.H. Hardenstine, R. Kamath, D. Kong, R.E. Hoffmann, and S. McMillen.
Remediation [Published online 5 August 2020 prior to print]

A detailed chemical characterization of lacustrine-sourced crude oils and a technical basis for measuring the effectiveness of bioremediation efforts for crude-impacted soil are provided in this study. The study demonstrated that the novel isoprenoid hydrocarbon botryococcane can be reliably measured using a gas chromatography/flame ionization detection methodology due to its stability and relatively elevated concentration in lacustrine oils. Thus, it can be used to monitor the progress of ongoing soil bioremediation activities at remote sites.

General News

REMEDIATION MANAGEMENT FOR LOCAL AND WIDESPREAD PFAS CONTAMINATIONS
Held, T. and M. Reinhard on behalf of the German Environment Agency, Report No. FB000332/ENG, 310 pp, 2020

This document was prepared as guidance to provide support to German regulative authorities to select, evaluate, and determine appropriate and fitting remedial solutions for localized and wide-spread cases of PFAS contamination. Due to the varying properties of the individual PFAS constituent compounds, any evaluation of technical remedial options should be based on the primary PFAS constituent compound of concern. Relevant remedial options, advantages and disadvantages, technical and German legal requirements, and the sustainability of each respective option are discussed. The work also incorporates the results of two Germany-wide technical workshops that were held in 2018 and 2019.
https://www.umweltbundesamt.de/sites/default/files/medien/5750/publikationen/2020_11_11_texte_205_2020_handbook_pfas.pdf

PHYTOREMEDIATION AND MICROORGANISMS-ASSISTED PHYTOREMEDIATION OF MERCURY-CONTAMINATED SOILS: CHALLENGES AND PERSPECTIVES
Tiodar, E.D., C.L. Vacar, and D. Podar.
International Journal of Environmental Research and Public Health 18:2435(2021)

This article reviews the current understanding of the uptake, translocation, and sequestration of Hg in plants to highlight and explore new avenues in phytoremediation research, discusses different phytoremediation strategies (phytostabilization, phytoextraction and phytovolatilization), and surveys research aimed at identifying suitable plant species and associated-microorganisms for use in phytoremediation of Hg-contaminated soils. The article also investigates the potential use of transgenic plants in Hg-phytoremediation and reviews recent research on exploiting the beneficial interactions between plants and Hg-resistant microorganisms (bacteria and fungi) that secrete plant growth promoting compounds. Lastly, the article highlights areas where more research is needed into the effective use of phytoremediation at Hg-contaminated sites. https://www.mdpi.com/1660-4601/18/5/2435/pdf

A REVIEW OF RECENT VAPOR INTRUSION MODELING WORK
Verginelli, I. and Y. Yao. | Groundwater Monitoring & Remediation 41(2):138-144(2021)

This paper reviews vapor intrusion modeling studies published from 2010-2020. While research in the late 1990s and the early 2000s focused on basic vapor transport phenomena and attenuation in the subsurface, topics addressed in recent years has focused on more complex scenarios, including the blocking effect of building footprint and surface pavements, soil and source heterogeneity, the role of capillary fringe, weather conditions such as rain, indoor-outdoor pressure differences, and temperature, building features, screening distances, and building pressure cycling. A brief description of these models and the main findings are reported. Generally, recent modeling considers the influence of natural factors, which are relatively easy to quantify and include in the model. Less attention was given to factors involving human activities, such as preferential pathways, indoor environment structure, and background sources. The latter, however, may play a key role in determining exposure to people of concern at sites contaminated with volatiles. Thus, future modeling studies should be oriented to address these issues.

GUIDE FOR DEVELOPMENT OF SAMPLE COLLECTION PLANS FOR RADIOCHEMICAL ANALYTES IN OUTDOOR BUILDING AND INFRASTRUCTURE MATERIALS FOLLOWING HOMELAND SECURITY INCIDENTS
Hall, K., J. Griggs, T. Stilman, K. Snead, S. Hudson, and L. Nguyen. EPA/600/R-20/097, 50 pp, 2020

This document provides a framework to develop and implement an approach to sample collection during the cleanup of outdoor building and infrastructure materials after a radiological contamination incident. The document incorporates processes that include quantitative and qualitative assessments at each stage of cleanup decision-making: from initial scoping and stakeholder outreach to evaluation of cleanup options and implementation of the chosen alternative. The elements in this document provide a general guide for preparation of homeland security incident-specific sample collection plans, which are needed to collect data once a contaminated site has been turned over to EPA, and must be in compliance with EPA requirements regarding quality assurance, quality control, and data quality objectives. Information in this document can be used to develop a systematic and integrated methodology for sample collection to meet data use needs and site disposition objectives. This framework is designed to assist incident commanders, project managers, state and local authorities, contractors, and enforcement divisions responsible for the sample collection approach.
https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=349143&fi eb=CESER&simplesearch=0&showcriteria=2&sortby=pubDate&trimstype=&datebeginpublishedpresented=06/15/2019&searchall=sample+collection

EDITOR'S PERSPECTIVE-HIGHLIGHTS OF RECENT REMEDIATION TECHNOLOGY INNOVATIONS PUBLISHED IN REMEDIATION
Simon, J.A. I Remediation 31(3):3-6(2021)

This Editor's Perspective highlights four innovative and emerging remediation technologies recently published or scheduled for publication in the *Remediation Journal:* •Surface-active foam fractionation for PFAS treatment. •PFAS groundwater treatment using alkaline ozonation. •PFAS groundwater treatment with sonolysis applied through horizontal wells. •Oleophilic biobarrier (OBB) reactive cap for controlling sheens and dissolved-phase discharges in surface waters.*Read page 1 at* https://onlinelibrary.wiley.com/doi/abs/10.1002/rem.21690

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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