Technology Innovation News Survey

Entries for July 1-15, 2019

Market/Commercialization Information

REGION 1 SUPERFUND TECHNICAL ASSESSMENT & RESPONSE TEAM 5 (START5)
Environmental Protection Agency, Region III, Philadelphia, PA.
Federal Business Opportunities, Solicitation 68HE0319R0004, 2019

This acquisition is unrestricted, NAICS code 541620. The Government intends to award a fixed-price, fixed-rate IDIQ-type START5 contract for a 4-year base period of performance and one option year to support U.S. EPA Region 1. The contractor shall supply a team of proficient Level A trained and experienced personnel to provide support during emergency responses. The Core Readiness Team (CRT) shall maintain a 24-hour, 7 days/week year-round response capability to respond to EPA's need on a Regional, backup Regional, and cross-Regional national and international response basis. The CRT shall comprise 10 field staff members having the qualifications and experience listed in Response and Key Personnel Qualifications. The CRT shall be used to staff removal actions and other work during periods when they are not responding to emergency responses, Stafford Act weapons of mass destruction incidents, or counter-terrorism drills and exercises. IDIQ task orders will be issued by the Contracting Officer for work outside the fixed-price portion. This solicitation closes at 4:00 PM ET on August 30, 2019. Monitor FedConnect for details at https://www.fedconnect.net/FedConnect/?doc=68HE0319R0004&agency=EPA

DEPARTMENT OF ENERGY, KNOLLS ATOMIC POWER LABORATORY AND KESSELRING SITE: REQUEST FOR INFORMATION
Department of Energy, Cincinnati, OH.
Federal Business Opportunities, Solicitation 89303319NEM000020, 2019

DOE's Environmental Management Consolidated Business Center (EMCBC) is in the acquisition planning stage for the potential award of a contract to complete services for environmental remediation: demolition and removal of facilities (contaminated); and regulatory and waste management at the Knolls Atomic Power Laboratory (KAPL) in Niskayuna, NY, and the Kesselring Site (KSO) in West Milton, NY. These sites are about 20 miles apart in upstate NY. All work resulting from this RFI will be managed by DOE EMCBC. The purpose of this Sources Sought/RFI is to identify SBA-certified 8(a) Alaskan Native Corporations (ANCs) or Tribally Owned Companies (NAICS code 562910, size standard 750 employees) with the capability to perform the required services in order to assess set-aside possibilities. Details are available only on FedConnect at https://www.fedconnect.net/FedConnect/?doc=89303319NEM000020&agency=DOE [Note: It might be necessary to copy and paste the URL into your browser for direct access]. Submit capabilities statements via email by 4:00 PM ET on August 30, 2019. https://www.fbo.gov/spg/DOE/PAM/HQ/89303319NEM000020/listing.html

$35M INDEFINITE DELIVERY INDEFINITE QUANTITY (IDIQ) SINGLE AWARD TASK ORDER CONTRACT (SATOC) FOR RAPID RESPONSE 5 SDVOSB
U.S. Army Corps of Engineers, USACE District, Omaha, NE.
Federal Business Opportunities, Solicitation W9128F-19-R-0023, 2019

The award made under this solicitation will be an SDVOSB set-aside IDIQ contract for immediate/rapid response under NAICS Code 562910, in support of the USACE Omaha District and its customers located nationwide (continental U.S., Alaska, Hawaii and U.S. outlying areas). The contract awarded will include both cost-reimbursable and firm-fixed-price features for remediation of various hazardous waste sites. This contract will have a base performance period of three years plus one 2-year option period, or until the $35M contract limit is reached, whichever occurs first. Offers will be accepted until 2:00 PM CT on September 9, 2019. https://www.fbo.gov/spg/USA/COE/DAC44/W9128F-19-R-0023/listing.html

COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY (CLEAN) IN NAVFAC ATLANTICS AOR, PRIMARILY IN THE NAVFAC MID-ATLANTIC, WASHINGTON, EURAFSWA, AND PUERTO RICO AORs
Naval Facilities Engineering Command, NAVFAC Atlantic, Norfolk, VA.
Federal Business Opportunities, Solicitation N62470-19-R-4016, 2019

This notice constitutes a request for submittal of SF-330 (A-E Qualifications) packages by firms interested in providing support services for Navy CLEAN, NAICS code 541330. This unrestricted procurement will result in one cost-plus-award-fee IDIQ A-E contract for CLEAN Environmental Engineering Support Services in NAVFAC Atlantic's area of responsibility for a base period of one year and four one-year option periods under a ceiling of $480M for the duration of the contract. The general scope of this requirement covers A-E services to provide program management and technical environmental services in support of the Navy's Environmental Restoration. The principal geographical regions encompassed by this contract include the states of Alaska, Arizona, California, Idaho, Maryland, Montana, Nevada, New Mexico, North Carolina, Oregon, Utah, Virginia, Washington, West Virginia, Wyoming, the District of Columbia, and Puerto Rico. To a lesser extent work will be in Europe and other NAVFAC Atlantic and DoD installations nationwide and overseas. Registration in SAM and in Wide Area Workflow at https://wawf.eb.mil/ is mandatory prior to award of a contract. SF-330 packages are due by 2:00 PM ET on September 9, 2019. https://www.fbo.gov/spg/DON/NAVFAC/N62470CON/N62470-19-R-4016/listing.html

EPA ENVIRONMENTAL SERVICES ASSISTANCE - AGENCY WIDE
Environmental Protection Agency, Office of Acquisition Solutions, Region I, Boston, MA.
Federal Business Opportunities, Solicitation 68HE0119R0002, 2019

U.S. EPA has an Agency-wide requirement for technical, analytical, and quality-assurance support to U.S. EPA programs, such as Office of Air, RCRA Program, Office of Enforcement and Compliance Assistance, Office of Water, Superfund Program, possibly other EPA programs, federal and state agencies, and tribal organizations. The purpose of this notice is to determine both the interest in this requirement and the most appropriate acquisition strategy in terms of quantity of contracts and potential set-asides. A Statement of Work and a Regional Task Area matrix [posted on FedConnect at https://www.fedconnect.net/FedConnect/?doc=68HE0119R0002&agency=EPA] identify approximate levels of effort per task area for individual Regions. The information contained in the Task Area Matrix was approximated based on historical data. Responses are due by 4:30 PM ET on September 10, 2019. The Government anticipates releasing a solicitation within 60 days of the responses to this notice for multiple 5-year IDIQ contracts. https://www.fbo.gov/spg/EPA/OAM/RegI/68HE0119R0002/listing.html

Cleanup News

PHYTOREMEDIATION OF CONTAMINATED SOIL IN A REMOTE NORTHERN LOCATION: A COST EFFECTIVE AND PREDICTIVE REMEDIATION STRATEGY
Poltorak, B. | SMART Remediation: March 20, 2019, Edmonton, AB, Canada. 21 slides, 2019

Plant growth-promoting rhizobacteria (PGPR) have been implemented to enhance phytoremediation systems (PEPSystems™) for cost-effective removal of petroleum hydrocarbons (PHCs), PAHs, and salt from soils. PEPSystems facilitates the production of abundant root biomass and the exponential growth of rhizobacteria, which facilitates degradation of PHCs and sequesters salt into plant foliage. The technology was first deployed in 2008 at the remote Nota Creek C-17 site near Norman Wells, Northwest Territories, to treat PHC- and salt-contaminated soil. Between 2008 and 2010, surface soil containing elevated salt levels was successfully treated. In 2011, PHC-contaminated soil was partially excavated and placed upon the on-site treatment area or stockpiled for future treatment. This excavated soil was successfully remediated between 2011 and 2016. In 2017, the remaining in situ PHC-contaminated soil was excavated, placed onto the treatment area, and successfully remediated. Backfilling the excavations and recontouring the site using the treated soil plus revegetation of the site was completed in 2018 to comply with NT reclamation requirements. Kinetic modeling of PEPSystems performance can be performed as the basis for predicting the length of time required to remediate PHC-contaminated sites.
https://2ziaphmm3zh1x23mj335yjxt-wpengine.netdna-ssl.com/wp-content/uploads/2018/12/SMART-Remediation-Edmonton-2019-Ben-Poltorak.pdf

A DECADE OF LARGE-SCALE ENHANCED REDUCTIVE DECHLORINATION: THE EVOLUTION IN THE USAGE OF A HIGH-VOLUME CONTROLLED-RELEASE ELECTRON DONOR SUBSTRATE AT URBAN BROWNFIELD SITES
Leonard, G. | Intersol 2018: International Conference-Exhibition on Soils, Sediments and Water, March 27-29, 20 slides, 2018

Lessons learned are presented from a review of results from 24 target treatment zones where a slow-release carbon substrate was used to provide enhanced reductive dechlorination of halogenated compounds. Created to treat large-scale plumes synonymous with problematic chlorinated solvent contamination, the technology was developed to transport widely through the subsurface post-injection while avoiding wash-out and still providing an effective and sustained treatment rate. The substrate has been applied in a wide range of geological and geochemical settings across Europe and America, targeting a variety of contaminants, with concentrations ranging from DNAPL to low dissolved phase.
https://www.intersol.fr/download/28032018/download.php?f=Intersol_2018_5-Gareth_Leonard_Regenesis.pdf

PERFORMANCE EVALUATION OF USAID'S ENVIRONMENTAL REMEDIATION AT DANANG AIRPORT
U.S. Agency for International Development (USAID), Office of Economic Growth, Education and Environment (E3), Office of Economic Policy, 110 pp, 2018

Remediation of the Danang Airport was a 10-year, $103.5 million project that aimed to characterize, remove and contain dioxin-contaminated soil and sediment from site hot spots. Originally, 73,000 m^3 contaminated soils and sediments were scheduled to be excavated from the airport into a secure landfill. Based on a 2010 environmental assessment, the project expanded to include in-pile thermal desorption to heat dioxin-contaminated soil to 335ºC, causing dioxin to break down into non-toxic components. The project excavated 162,567 m^3, treated 94,593 m^3 and contained 67,974 m^3 of contaminated soil in landfills. It was cost-effective, treating large amounts of dioxin and contaminated materials at a low per-unit cost and in a short time. https://pdf.usaid.gov/pdf_docs/PA00TDS3.pdf *See video for more information:* https://www.usaid.gov/news-information/videos/pile-thermal-desorption-iptd-animation *See presentation for more information:* https://www.aspeninstitute.org/content/uploads/2017/09/4-Kent_Sorenson-et-al-Dioxin-2017.pptx

ACCELERATED DEPLOYMENT AND STARTUP OF ION EXCHANGE GROUNDWATER TREATMENT SYSTEM ADDRESSES PFAS CONTAMINATION AT AUSTRALIAN AIR BASE
Woodard, S. and V. Pearce. | PFAS in Groundwater Workshop: The Professional's Challenge, 14-15 May, St. Paul, Minnesota, 2018

Historical use of aqueous film-forming foam (AFFF) at the Royal Australian Air Force (RAAF) Base Williamtown in New South Wales resulted in PFAS contamination of groundwater and stormwater that migrated off base. Defense adopted a phased approach to manage the PFAS contamination at RAAF Williamtown, including accelerated design, fabrication, overseas transport, startup and operation of a successful Phase 1 water treatment system. Phase 1 involved testing a 50-gpm treatment system to demonstrate the effectiveness of the ion exchange resin-based technology. The modular treatment system was installed in a 40-ft shipping container where a set of lead and lag vessels containing Sorbix A3F regenerable anion exchange resin remove the PFAS compounds. To minimize the time required to initiate PFAS remediation, a RAAF C-17 cargo plane was used to transport the modular system from the U.S. to Australia, saving a month of transport time. The system has been operating continuously and successfully since startup in June 2017. There have been no detections of any of the 34 PFAS compounds in the treated effluent, and no resin regeneration or change-out has been required.
See a poster by M. Sinnett for more information:
http://rpic-ibic.ca/images/Accelerated_Deployment_and_Startup_of_Ion_Exchange_Groundwater_Treatment_System_Addresses_PFAS_Contamination_in_Stormwater_at_an_Australian_Air_Base.pdf

Demonstrations / Feasibility Studies

SANDIA NATIONAL LABORATORIES, NEW MEXICO: ENVIRONMENTAL RESTORATION OPERATIONS, CONSOLIDATED QUARTERLY REPORT, APRIL-JUNE, 2018
U.S. Department of Energy, Sandia Field Office, 115 pp, 2018

This environmental restoration report for Sandia National Laboratories describes the implementation of Phase 1 of a phased treatability study/interim measure of in situ bioremediation (ISB) to evaluate the effectiveness of ISB as a potential technology to treat dissolved-phase TCE in the Technical Area-V groundwater area of concern. Phase I includes a pilot test followed by full-scale injection at the first injection well (TAV-IN1); Phase II will include full-scale injections at two more injection wells if warranted by the findings of the Phase 1 full-scale operation. The pilot test began in November 2017 at injection well TAV-IN1 and two nearby monitoring wells. Two gravity-fed injections of ~4,500 gal each to deliver substrate solution and biodegradation bacteria to the groundwater were completed on November 22 and 27, respectively. Section III of this report (**PDF pages 58-64**) provides a summary of the pilot test activities and associated results. https://hwbdocuments.env.nm.gov/Sandia%20National%20Labs/2018-10-19%20ER%20Operations%20Consolidated%20Quaterly%20Rpt%20Apr%202018%20-%20Jun%202018.pdf See the October-*December 2018 quarterly report* (**PDF pages 50-57**) *for information on the Phase I full-scale injection activities:*
https://hwbdocuments.env.nm.gov/Sandia%20National%20Labs/2019-04-22%20ER%20Operations%20Consolidated%20Quarterly%20Rpt_%20Oct%20-%20Dec%202018.pdf

APPLICATION OF γ -PGA AS THE PRIMARY CARBON SOURCE TO BIOREMEDIATE A TCE-POLLUTED AQUIFER: A PILOT-SCALE STUDY
Luo, S.G., S.C. Chen, W.Z. Cao, W.H. Lin, Y.T. Sheu, and C.M. Kao.
Chemosphere 237:124449(2019)

A pilot-scale study demonstrated the use of gamma poly-glutamic acid (γ-PGA) as a carbon and nitrogen source to bioremediate a TCE-contaminated aquifer. Groundwater samples collected from monitor and injection wells were analyzed for TCE and its byproducts, geochemical indicators, dechlorinating bacteria, and microbial diversity. The γ-PGA addition increased total organic carbon (up to 9820 mg/L), which subsequently biodegraded and caused anaerobic conditions within the aquifer. Up to 93% of TCE removal was observed (from 0.14 to 0.01 mg/L) 59 days after γ-PGA injection, and dechlorination of TCE by-products was also observed. Next-generation sequencing determined that the γ-PGA supplement developed reductive dechlorinating conditions and caused variations in microbial diversity and 4 groups of bacterial species, including dechlorinating bacteria, VC-degrading bacteria, hydrogen-producing bacteria, and carbon biodegrading bacteria.

2017 GROUNDWATER ASSESSMENT REPORT, IDAHO POLE COMPANY SITE, BOZEMAN, MONTANA
U.S. EPA Region 8, 61 pp, 2018

Results of groundwater monitoring conducted at the Idaho Pole Company site from January 2017 through December 2017 included performance data from pilot tests conducted at the site during 2015 and 2016. Nutrients injected into groundwater in the bark fill area, along with a surfactant and increased aeration of injection water, were intended to increase microbial activity in groundwater and accelerate degradation of PCP and residual diesel-range petroleum hydrocarbons. At source area wells S-A and P-2, the PCP concentrations increased soon after each injection and remained elevated after the pilot injections. After the second pilot test, observed PCP concentrations frequently exceeded 1,000 µg/L at SA and 100 µg/L at P-2. At source area wells EW-1 and P-4, PCP concentrations increased after the second pilot test but then declined. PCP concentrations at EW-1 nearly 1.5 yrs after the second pilot injections were between 50-100 µg/L, similar to the PCP concentrations at EW-1 before the pilot tests. PCP concentrations at P-4 nearly 5 years after the second pilot injections werehttps://semspub.epa.gov/src/document/08/100004963 *See also the 2016 Phase II Pilot Study Report at* https://semspub.epa.gov/src/document/08/1817880

SELF-SUSTAINING TREATMENT FOR ACTIVE REMEDIATION (STAR) PRE-DESIGN EVALUATION (PDE) REPORT, QUENDALL TERMINALS, RENTON, WASHINGTON
U.S. EPA Region 10, Doc. ID 100116994, 122 pp, 2018

Creosote manufacturing was conducted at Quendall Terminals from 1916 to 1969, where distillation of coal and oil-gas tar residues led to environmental releases of coal tar and distillate products, mainly in material handling, production, storage, and disposal areas. DNAPL impacts at the site have been observed to a maximum depth of 34 ft bgs. STAR is an innovative in situ thermal technology based on the principles of smoldering combustion, where organic contaminants are the source of fuel. The smoldering process is sustained by the addition of air through a well to the target treatment zone and is initiated through a short-duration, low-energy ignition event. Based on the results of a bench-scale treatability study, a field pilot test was recommended to evaluate key design parameters for a full-scale STAR system and to evaluate the potential influence of site-specific matrix heterogeneities on the process. A field pre-design evaluation was then conducted to evaluate the combustion front radius of influence, mass destruction and combustion front propagation rates, and volatile mass loading in collected vapors. This report describes the field activities, feasibility results, and recommendations for implementing the STAR in situ thermal technology. https://semspub.epa.gov/work/10/100116994.pdf

Research

BENEFITS OF COMBINING IN SITU CHEMICAL OXIDATION WITH IN SITU STABILIZATION: SYNERGIES AND SOLUTIONS FOR COMPLEX SITES
Pare, J. | SMART Remediation: March 20, 2019, Edmonton, AB, Canada. 15 slides, 2019

In situ solidification/stabilization (ISS) mixes cementitious reagents with contaminated soils to reduce contaminant bioavailability and leachability. Various reagents are used to promote ISS, such as Portland cement, blast furnace slag, and lime kiln dust. Several of these reagents contain calcium oxide, also known as quicklime. High concentrations of organic contaminant can interfere with cementation reactions, requiring excessive application of amendments and increasing both amendment and disposal costs of the displaced soil. This ISS limitation can be minimized by combining the remedy approach with in situ chemical oxidation (ISCO) to degrade some of the organic contaminants present. This presentation explores the advantages and limitations of using a combined ISCO-ISS remedy on contaminated soil from different petroleum hydrocarbon sites, reviewing both current literature and bench and field data. Using common ISS reagents to activate Klozur SP oxidant, the activated SP chemically oxidized a significant portion of the contaminants of concern (COCs) for all the ISCO-ISS treatments. The mass of COCs oxidized increased with increasing SP dose. The lowest molecular weight contaminants were oxidized preferentially. For the same SP dose, combined ISCO/ISS treatment was more effective in reducing contaminant leachability than ISS treatment alone because of the COC removal achieved by the ISCO (activated SP) component. Data are presented from three ISCO-ISS implementation case studies. https://2ziaphmm3zh1x23mj335yjxt-wpengine.netdna-ssl.com/wp-content/uploads/2018/12/SMART-Remediation-Edmonton-2019-Jean-Pare.pdf

INFLUENCE OF CELERY ON THE REMEDIATION OF PAHS-CONTAMINATED FARM SOIL
Wang, H., Y. Zhao, A. Muhammad, C. Liu, Q. Luo, H. Wu, X. Wang, X. Zheng, K. Wang, and Y. Du. | Soil and Sediment Contamination: An International Journal 28(2):200-212(2019)

A study of celery employed as a PAHs phytoremediator examined the soil enzyme activity, PAHs-degrading microorganisms, and PAHs speciation in soil. Results showed that celery could enhance PAHs remediation significantly compared with the control after 90 days, with removal efficiencies of 31.29% in soil, 30.79% in non-rhizosphere soil, and 50.21% in rhizosphere soil. Soil enzyme activity and PAHs-degrading microorganisms increased in rhizosphere soil compared with non-rhizosphere soil. PAHs concentration in the edible portion of celery was only 17.13 ± 1.24 µg/kg, and bioconcentration factors in the aboveground part of celery were only 0.025. This study provides an indication of potential practical utility for celery in farmland soil phytoremediation.

ECOSYSTEM SERVICES OF POPLAR AT LONG-TERM PHYTOREMEDIATION SITES IN THE MIDWEST AND SOUTHEAST, UNITED STATES
Zalesny, R.S., W.L. Headlee, G. Gopalakrishnan, E.O. Bauer, R.B. Hall, D.W. Hazel, et al.
WIREs Energy and Environment [Publication online 18 Jun 2019 prior to print]

Fifteen poplar plantings from nine long-term phytoremediation installations were sampled from 2012 to 2013 in the U.S. Midwest (Illinois, Iowa, Wisconsin) and Southeast (Alabama, Florida, North Carolina). Performance sampling results at each site were compared with similar phytoremediation systems in the literature. Review of significant genotypic differences from each planting was performed for biomass production and carbon sequestration ecosystem services. Results show that phytoremediation success can be increased by appropriate selection and deployment of poplar genotype, whether generalist genotypes, which are tailored to grow well and tolerate a broad diversity of contaminants, or specialist genotypes that significantly outperform their counterparts under unique site conditions. Overall, the contaminated poplar sites provided ecosystem services comparable to uncontaminated poplar sites used for bioenergy and biofuels feedstock production. *See additional information in 22 slides at* http://www.poplar.ca/upload/documents/ipc-2014/s5-p8-zalesny-prot.pdf

PCBS IN OLDER BUILDINGS: MEASURING PCB LEVELS IN CAULK AND WINDOW GLAZING MATERIALS IN OLDER BUILDINGS
Osemwengie, L. and J. Morgan.
Environments 6(2):15(2019)

A method developed for the determination of PCBs in caulk was evaluated by application to a combination of 47 samples of caulk, glazing materials, and quality control samples from four schools in the northeastern area of the United States. The choice of materials for testing the method's efficacy arose from the extensive use of caulk and glazing materials in older U.S. school buildings. Samples were collected from the interior and exterior doors, windows, interior building seams, around installed fixtures and appliances, and within interior and exterior building joints. Quality control analysis showed a range of 45-170% for spike recovery from the various samples and a range of 10.9-20.1% difference in precision. Results for the samples analyzed showed that three of the four schools sampled contained caulking and glazing materials with levels of PCBs >50 µg/g (range 54.6 µg/g to 445,000 µg/g). Across the four schools, 24% of collected caulk and glazing samples had elevated PCB levels relative to U.S. EPA's 50 µg/g criteria under TSCA. The PCBs determined in the samples exhibited characteristic chromatographic patterns similar to those of Aroclor 1242, 1248, 1254, 1260, 1262, and a 1016/1254 mix. https://www.mdpi.com/2076-3298/6/2/15/htm

INDUCED POLARIZATION AS A MONITORING TOOL FOR IN-SITU MICROBIAL INDUCED CARBONATE PRECIPITATION (MICP) PROCESSES
Saneiyan, S., D. Ntarlagiannis, J. Ohan, J. Lee, F. Colwell, and S. Burns.
Ecological Engineering 127:36-47(2019)

Microbial induced carbonate precipitation (MICP) is a promising soil stabilization method performed by stimulating soil microbes that are naturally occurring and ubiquitous in soil systems. The precipitated carbonate acts as a cementation agent to bind loose soil at grain-to-grain contacts. The method has been studied for immobilizing contaminating metals and for prevention of slope failure in existing mine tailings dams. Currently, long-term field applications are challenged by quality control and monitoring issues. In a 15-day field-scale MICP treatment involving the injection of a molasses carbon source and urea in a Ca^{2+}-rich aquifer, induced polarization (IP) monitoring successfully delineated, spatially and temporally, MICP propagation in the treatment area, while common resistivity measurements failed to capture any MICP-related changes. Reduced hydraulic conductivity in the treated versus untreated areas further supported the effect of MICP treatment on subsurface physical properties. Conventional geochemical monitoring and X-ray diffraction analysis confirmed carbonate precipitation in samples from wells in the treatment area.

SNAKES AS NOVEL BIOMARKERS OF MERCURY CONTAMINATION: A REVIEW
Haskins, D.L., R.M. Gogal Jr., and T.D. Tuberville.
Reviews of Environmental Contamination and Toxicology 249:133-152(2018)

The results of over 30 studies to discuss the impact of Hg on snakes were compiled and analyzed in a review of sources of exposure, bioaccumulation, health consequences, and specific scientific knowledge gaps regarding these moderate to high trophic predators.

NEW INSIGHTS INTO THE DEGRADATION MECHANISM OF PERFLUOROOCTANOIC ACID BY PERSULFATE FROM DENSITY FUNCTIONAL THEORY AND EXPERIMENTAL DATA
Zhang, Y., A. Moores, J. Liu, and S. Ghoshal.
Environmental Science & Technology 53(15):8672-8681(2019)

Density functional theory calculations and experimental data were used to map entire reaction pathways for the degradation of PFOA by persulfate, with specific considerations on the influence of pH. This study provides insight into remediation strategies that include persulfate as an oxidizing agent for perfluoroalkyl carboxylic acids.

BIOELECTROCHEMICAL SYSTEMS FOR GROUNDWATER REMEDIATION: THE DEVELOPMENT TREND AND RESEARCH FRONT REVEALED BY BIBLIOMETRIC ANALYSIS
Li, W., X. Chen, L. Xie, Z. Liu, an X. Xiong.
Water 11(8):1532(2019)

Researchers collected studies published from 1999-2018 in the Web of Science Core Collection that focused on information related to bioelectrochemical systems in order to visualize the development trajectory and trends of the technology. Studies that focused on bioelectrochemical systems for groundwater remediation have increased in the last 2 decades, especially in China, Germany, Italy, and the U.S. Network maps of the keywords and burst terms suggest that recent research has focused on reductive microbial diversity, electron transfer, and microbial fuel cells. Future studies should focus on microbial enrichment culture, energy supply/recovery, and combined pollution remediation. *This article is* ***Open Access*** *at* https://www.mdpi.com/2073-4441/11/8/1532

General News

PASSIVE SAMPLING FOR CONTAMINATED SEDIMENT SITES
Naval Facilities Engineering Command, ESTS N39430-16-D-1802, 8 pp, 2018

The most commonly used types of passive samplers-polyethylene devices, polyoxymethylene, polydimethylsiloxane-coated solid-phase microextraction, polar organic chemical integrative samplers, and diffusive gradient in thin film (DGT®)-are described and accompanied by preparation and deployment considerations. Key data analysis steps are highlighted for extraction and analysis and the interpretation of results related to the calculation of water concentrations, mass transfer models, QA/QC, and bioaccumulation prediction.
https://www.navfac.navy.mil/content/dam/navfac/Specialty%20Centers/Engineering%20and%20Expeditionary%20Warfare%20Center/Environmental/Restoration/er_pdfs/p/navfacexwc-ev-fs-passivesampling-201809.pdf

ABSTRACT BOOK: ENVIRONMENTAL RISK ASSESSMENT OF PER AND POLYFLUOROALKYL SUBSTANCES (PFAS)
Society of Environmental Toxicology and Chemistry (SETAC) Focused Topic Meeting, 12-15 August, 56 pp, 2019

The sessions of the 4-day meeting were organized as follows: environmental sources, chemistry, fate, and transport of PFASs; exposure; ecological toxicity; human toxicity; risk assessment and characterization; and treatment and remediation. This book contains the abstracts of the presentations for the meeting's platform and poster sessions. https://pfas.setac.org/wp-content/uploads/2019/06/FINAL-PFAS-abstract-book-v2.pdf

REMEDIATING POLLUTED SOILS USING NANOTECHNOLOGIES: ENVIRONMENTAL BENEFITS AND RISKS
Medina-Perez, G., F. Fernandez-Luqueno, E. Vazquez-Nunez, F. Lopez-Valdez, J. Prieto-Mendez, A. Madariaga-Navarrete, and M. Miranda-Arambula.
Polish Journal of Environmental Studies 28(3):1013-1030(2018)

This paper compiled updated information and patents to summarize the environmental benefits and risks associated with using nanotechnologies to remediate polluted soils. The authors highlight advantages and disadvantages of dealing with the final disposal of nanoparticles, nanomaterials, or nanodevices. Future studies are recommended to assess nanoparticle toxicity and technique standardization. *This article is* ***Open Access*** *at* http://www.pjoes.com/Remediating-Polluted-Soils-Using-nNanotechnologies-Environmental-Benefits-nand-Risks,87099,0,2.html

PERMEABLE REACTIVE BARRIER: A TECHNOLOGY FOR GROUNDWATER REMEDIATION - A MINI REVIEW
Maitra, S. | Research Journal of Life Sciences, Bioinformatics, Pharmaceuticals, and Chemical Sciences 5(1):203(2019)

An overview of permeable reactive barrier configurations, including scientific research that integrates this method with sustainability and green technology practices, is presented. http://www.rjlbpcs.com/article-pdf-downloads/2019/24/477.pdf

STATE OF THE ART AND FUTURE CHALLENGES FOR POLYCYCLIC AROMATIC HYDROCARBONS IS SEDIMENTS: SOURCES, FATE, BIOAVAILABILITY AND REMEDIATION TECHNIQUES
Maletic, S.P., J.M. Beljin, S.D. Roncevic, M.G. Grgic, and B.D. Dalmacija.
Journal of Hazardous Materials 365:467-482(2019)

PAH sources and fates in sediments, remediation techniques, bioavailability, bioaccessibility analytical methods, and European Union regulations for PAH contamination are discussed in this publication. Further investigation is recommended on risk assessment, remediation, and monitoring as well as how to incorporate findings into new legislation.

THE GROUNDWATER SPATIOTEMPORAL DATA ANALYSIS TOOL (GWSDAT) FOR GROUNDWATER QUALITY ANALYSES
Jones, W.R., M. Bonte, and K. Cady.
CL:AIRE (Contaminated Land: Applications in Real Environments), London, UK. Technical Bulletin TB21, 4 pp, July 2019

GWSDAT was developed as an easy-to-install, freely available, user-friendly, and open-source software tool to analyze and report trends in groundwater quality monitoring data. This technical bulletin summarizes software architecture, installation requirements, application and functionalities, and planned future developments. *See the bottom of the page at* https://www.claire.co.uk/component/phocadownload/category/17-technical-bulletins

ADSORPTIVE NANOCOMPOSITE MEMBRANES FOR HEAVY METAL REMEDIATION: RECENT PROGRESSES AND CHALLENGES
Nasir, A.M., P.S. Goh, M.S. Abdullah, B.C. Ng, and A.F. Ismail
Chemosphere 232:96-112(2019)

This review discusses the development of nanoadsorbents and adsorptive nanocomposite membranes for heavy metal removal over the last decade. The adsorption mechanism of heavy metal ions by the advanced nanoadsorbents is also discussed using kinetic and isotherm models. The challenges and future prospect of adsorptive membrane technology for heavy metal removal is presented at the end of this review

TOOLS FOR ESTIMATING CONTAMINANT MASS-IN-PLACE, MASS DISCHARGE, AND REMEDIATION TIMEFRAMES
Chambon, J., N. Durant, and S. Rosansky.
TM-NAVFAC-EXWC-EV-1801, 39 pp, 2018

In this review of tools applicable to estimating contaminant mass in place, contaminant mass discharge, and remediation timeframes, each of the three reviews is followed by a case study that illustrates how tool results were used to improve site-specific remedial strategies.
https://www.navfac.navy.mil/content/dam/navfac/Specialty%20Centers/Engineering%20and%20Expeditionary%20Warfare%20Center/Environmental/Restoration/er_pdfs/m/NAVFAC-Mass-Estimation-Tech-Memo-Aug2018.pdf

The Technology Innovation News Survey welcomes your comments and suggestions, as well as information about errors for correction. Please contact Michael Adam of the U.S. EPA Office of Superfund Remediation and Technology Innovation at adam.michael@epa.gov or (703) 603-9915 with any comments, suggestions, or corrections.

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